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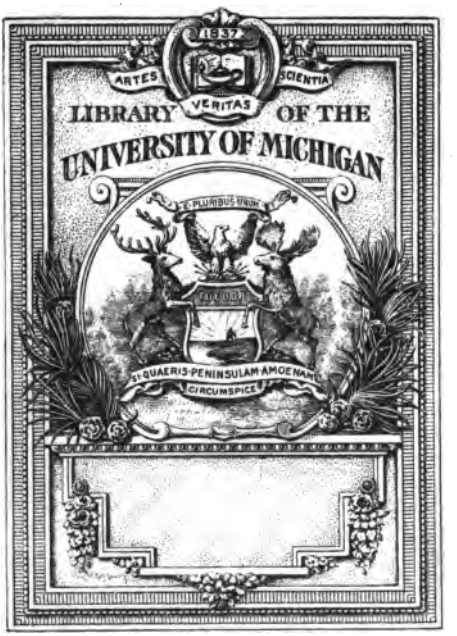
CATARACT:

ITS NATURE, CAUSES,

PREVENTION, AND CURE.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CATARACT:

ITS NATURE, CAUSES,

PREVENTION, AND CURE.

CATARACT:

ITS

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NATURE, CAUSES,

PREVENTION, AND CURE,

BY

J. COMPTON BURNETT, M.D.

It is consonant with the right Method of philosophising, first to analyse the subject, whose Nature and Properties we intend to make any Researches into, by a regular and numerous Series of Experiments: And then, by laying the Event of these experiments before us in one View, thereby to see what Light their united and concurring Evidence will give us. . . . . The Capital things of Nature generally lie out of the beaten Paths, so that he who would make new and useful Discoveries, must take the Pains to walk by himself in untrodden Roads.—MDCCLXIV.

BROWNE LANGRISH.

(The Modern Theory and Practice of Physic.)

LONDON:
THE HOMŒOPATHIC PUBLISHING COMPANY,
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1889.

EDWARD THOMAS, PRINTER, CAXTON BUILDINGS,
PEPPER STREET, CHESTER.

To the

Memory

OF

Grauvogl

UNDER THE EVER-LIVING

INFLUENCE OF WHOSE GREAT TEACHINGS

THIS HUMBLE EFFORT

IS HOPEFULLY DEDICATED BY

The Author.

PREFACE.

I HAVE endeavoured in the following pages to bring together the cream of what I have read, seen, and do know of the nature, causes, and cure of Cataract. For this information I have gleaned in many fields, and wandered in many more where there was, unhappily, nothing to glean. Cataract having been declared immedicable by the Schools, it is not astonishing that those who pass through the Schools, (for the most part like sheep through a gap,) should live their practical lives as the mere echoes of their scholastic teachings, and thus it comes to pass that no progress is made in ophthalmic *medicine*, indeed such a person as an ophthalmic *physician* does not, I believe, exist in Europe.

That wonderful, wonderfully beautiful complicated apparatus known as the eye, in *all* its ailings is really and literally and always treated in handworker-fashion with washes, greases, and those endless pretty little clipping, scooping, cutting, and scraping instruments by our eye-doctors.

The particular affection known as cataract is peculiarly unfortunate, for, apart from here and there a great man who has cast as it were a side-glance upon it, it has been principally ignorant and wicked quacks who have occupied themselves with its medicinal cure, so much so indeed that those few Medical men who do try to cure Cataract with Medicines actually dare not confess that they do so lest they be gravely misunderstood. Mrs. Grundy is bad enough, but Mrs. Dr. Grundy literally freezes the marrow of the most stalwart.

As an example of a great man's views of the medicability of Cataract, I will name Walther, who says:—

> "Ich halte den anfangenden Staar, seitdem ich seine Genesis kenne, nicht mehr für unheilbar, und ich bekämpfe ihn bereits in einigen Fällen mit Erfolg. Wie paradox ist doch der Trost, mit welchem man den Schwachsichtigen mit anfangender Cataract zu entlassen pflegt: er müsse erst ganz erblinden, dann erst könne ihm wieder ein Licht erscheinen. Es ist nur Trägheit der Aerzte und Verzweiflung, was den Kranken durch die lange Nacht immer sich mehrender Finsterniss einem neuen Tage entgegen gehen heisst."
>
> PH. FR. WALTHER.
>
> ["Abhandlungen," Landshut, 1810, dem *Hufeland* gewidmet.]

For myself I may say that I put my hand to the plough thirteen years ago and, God helping me, I will never turn back.

J. COMPTON BURNETT.

5, *Holles Street,*
Cavendish Square, W.
June 7th, 1889.

Cataract:

Its Nature, Causes, Prevention, and Cure.

In the winter of the year 1875, I cured a case of cataract with medicines.* It was practically what is commonly called a *fluke*, or at least, I treated the patient at her own wish with medicines, yet did not quite believe it was possible to cure cataract with medicines: however the cataract cleared up under the treatment and the partly blind lady regained her sight and . . . kept it.

As I have elsewhere explained, this led to my studying the literature of the subject of cataract and publishing it in the year 1880, under the title of 'Curability of Cataract with Medicines.' This work was reprinted in the United

* See my "Curability of Cataract with Medicines," London 1880, *pp.* 2—15.

States of America, and was subsequently translated into German by Dr. H. Goullon of Weimar. It is a great satisfaction to me that my efforts have been so far crowned with success; much more success, indeed, than I could have anticipated, considering the gross professional and laic ignorance and prejudice * existing on the subject.

From the year 1875 till now I have been in the habit of treating cataract by medicines, with great patience and perseverance, and in the teeth of much

* The following will illustrate the kind of prejudice I mean. A lady patient of mine was conversing with me one day and mentioned that the late Hofrath Dr. de Leuw, of Gräfrath, had cured her many years ago of double cataract with medicines, and on my asking how he did it, she promised to send me all his prescriptions, and in doing so wrote thus:— "I forgot to tell you that——, who was assistant to the late Hofrath, Dr. De Leuw, is practising at——, and would probably have his formulas, though from one summer's treatment by him,

opposition, ridicule, and slander. But the sneering and jeering of those eye-carpenters who would have the world believe that knife-work is the be-all and end-all of ophthalmology have not deterred me from pursuing the even tenour of my way—*trying to cure cataract with medicines.*

The revenge which I take upon my calumniators is sweet indeed—For I have not only gone on all these years *trying* to cure cataract with medicines, *but I have very often succeeded*, so that my present position in regard to the amenability of cataract to medicinal

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and from what I have heard, he does not follow his gentle, patient methods, especially with cataract, but resorts to more violent and trying remedies. One striking case of the Hofrath's skill you may like to know. A Mrs. ———— aged 73, was getting blind, and went to the famous oculist, Beaumont or Bowman, I forget how it is spelt. He said she had cataract, which would be quite ready for operating in April, (this was in August.) The old lady, much depressed at the prospect, was persuaded by

treatment is a good deal more positive; and my present view amounts to this—that any ophthalmologist who cannot at least arrest the progress of a very large percentage of his cataract cases does not know his business. Only, of course, it must be borne in mind that specialists *dare not* give medicines *internally*, they are only surgeons; and Mrs. Dr. Grundy does not allow them to practise real ophthalmiatrics even though they knew how, which they do not.

I will now proceed to define my position, referring my readers to

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friends to spend the autumn in Gräfrath, as offering a chance of cure, or at least, a pleasant distraction. She was under the Hofrath two or three months, and took home remedies for the winter, which she found most beneficial. Having a dash of fun in her, she went in April to the oculist, and asked whether her eye was fit for an operation;—after repeated examinations and varied astonished exclamations, he said, 'Never saw such a thing in my life! most marvellous! It seems as if the cataract were

'Curability of Cataract with Medicines,' for the details and the historic development of the doctrine that cataract can be cured by medicines by those who will take the trouble to study the subject, provided they have the capacity, with patience and perseverance not a little.

If there be one reason greater than another which prevents progress in curative medicine it is the entirely false conception so many have both within and without the profession to the effect that a disease is an entity by itself, requiring a good stout therapeutic entity to oust it.

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actually disappearing! Operation? No, not to be thought of—cannot understand it.' 'Do you think my eye better?' 'Of course it is—most wonderful case' 'Well, I have been to the Hofrath De Leuw.' 'What! to that Prince of Humbugs! etc. etc.' 'Yes, and shall continue to go,' and I had the pleasure of escorting her to him the next summer. She kept a good measure of sight until the Hofrath's death; then acute gout came on, and for two years before she died she was blind."

For instance, a short time since a lady, suffering from cataract, and who had been long under my treatment with very evident benefit, went at my request to one of the first eye-surgeons of the day practising here in London. He was not aware that patient had had a prolonged course of treatment from me for her cataracts, and he was clearly puzzled by what he found. "Well," said he, "it will probably be a long time before you will need to come to me again." Years before, the necessity for an operation in the near future had been admitted and foretold by him. On leaving, the lady mildly and slyly interposed this remark "What about medicines: is there then NO medicine for cataract?"

Note the reply: "No, there is no medicine that will cure cataract, for if there had been *one* my father would have found it out, though I am sorry to say there are some impostors who say there is."

I have nothing to say against this laudable filial piety, and I am not concerned with the goody shallowness evidenced by the reply, but rather would dwell a little upon its fundamental wrongheadedness. To begin with, this good chirurgeon's father *never even tried to cure cataract with medicines*—how, therefore, was he ever likely to find medicines availing?

And, further, inasmuch as the kinds of cataract are numerous and different, and their causes various, is it CONCEIVABLE that *one* remedy could ever cure more than *one* variety of cataract?

Still on that contemptible level are nearly ALL the GREAT MASTERS of eye-diseases throughout the civilized world; they are just gentlemen handworkers, and do I expect to convert these busy eye-carpenters to a belief in ophthalmiatrics of a higher kind as against knife-work, washes, and "drops"? Not at all. I indeed know a better

way than theirs, which I am trying to teach—and that is the whole affair. From both master and journeymen eye-carpenters I do not expect any hearing at all—not even an unfair one—nor yet from ninety odd per cent. of the profession of either of the principal pathies.

It will be evident, therefore, that as I expect so little I shall hardly be disappointed. Time was when I thought that if a medical man wrought some difficult unexpected cures, his colleagues would hail him, or at least his work, with delight, and want to know all about it. Why it is not so is a question I will leave to psychology, political economy, and trades-unionism, and proceed without any more grumbling to my self-imposed task.

I think I could hardly do better than commence about the causation of cataract; but before doing so we will

first consider the organ which is the seat of the cataractous process, *i.e.*, the LENS.

THE LENS.

The lens is a little transparent lentil-like body in the eye, lying between the cornea and the vitreous, and, when opaque, readily seen in the pupil. Being in shape like a lentil (lens) it is called the lens; being clear and crystalline, it is called the crystalline lens, and then the substantive is often dropped and the adjective crystalline used substantively, *e.g.*, the crystalline. The terms used in other languages are analogous if not identical, the Greek Τὸ Φακοειδὲς ὑγρόν being perhaps the prettiest.

The lens * is usually described as a doubly convex transparent solid body

* Far away the best and prettiest descriptive account of the eye I have ever read in any language is contained in a charming little work

with a rounded circumference and of a laminated structure. It measures about $\frac{1}{3}$ of an inch across and $\frac{1}{5}$ from before backwards.

In a fresh lens the outward portion is soft and easily detached; the succeeding layers are of a firmer consistence; and, in the centre, the substance becomes much harder, constituting the nucleus. On the anterior and posterior surfaces are faint white lines directed from the poles towards the circumference; these in the adult are somewhat variable and numerous on the surface, but in the fœtal lens throughout, and towards the centre of the lens in the adult, they are three in number, diverging from each other like rays at equal angles of 120°, the lines at opposite poles have an intermediate position:

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entitled "The Five-Barred Gate: A Story of the Senses" by James Crowther, London; Sunday School Union. (The title is taken from Bunyan's "Holy War.")

they are the edges of planes or septa projecting vertically inwards to the centre of the lens, and receiving the ends of the lens fibres which are collected upon them.

Structure: When the lens has been dried, or hardened by immersion in spirit, concentric laminae, narrowing to a point at the poles, may be detached from it.

The laminae are further composed of microscopic fibres, which adhere together by wavy or slightly serrated margins. The lens is albuminous in its composition; is devoid of blood-vessels; and at the planes of intersection a finely granular homogeneous material takes the place of the fibres.

The fibres of the lens are somewhat flattened threads, about $\frac{1}{5000}$ of an inch wide, and are directed over the edge of the lens from the planes on one surface to those on the other. In their course between the opposite surfaces, no fibre

passes from pole to pole, but the fibres beginning in the pole in the centre of one surface terminate in the end of a plane in the opposite surface, and *vice versâ*, the intervening fibres passing to their corresponding places between.

In the fœtus the lens is nearly spherical: it has a slightly reddish colour, is not perfectly transparent, and is softer and more readily broken down than at a more advanced age. In the adult the anterior surface of the lens becomes less convex than the posterior, and the substance of the lens is firmer, colourless and transparent.

In old age it is more flattened in both surfaces; it assumes a yellowish or amber tinge, and is apt to lose its transparency as it gradually increases in toughness and specific gravity. *(Quain.)*

The lens enclosed in a capsule, is situated behind the pupil and in front of the vitreous body.

The capsule of the lens, a transparent glass-like membrane closely surrounding the contained body, is hard and brittle, especially in front, but very elastic and permeable to fluid. The anterior surface is in contact with the iris towards the pupil, and recedes from it slightly at the circumference; the posterior rests closely on the vitreous body. In its nature the capsule of the lens resembles the glassy membrane at the back of the cornea for it is structureless, and remains transparent under the action of acids, alcohol, and boiling water.

Connecting the anterior wall of the capsule closely to the lens is a single layer of granular and nucleated polygonal cells, which ends abruptly where the capsule comes in contact with the hyaloid membrane. The place of termination of this cellular layer round the margin of the lens corresponds to the line from which the fibres of the lens are developed.

There is no such layer of cells in the posterior well of the capsule.

The above is abbreviated from Bowman.

Histogenesis of the Lens.

Haddon tells us in his epitome on the subject of the eyes of the vertebrates that these are of a *compound nature*, PART being developed from the BRAIN and part from the OUTER SKIN of the head, both these elements being therefore of epiblastic origin and *protected by mesodermal* structures.

The first rudiment of the eye to appear is a pair of diverticula which bud out from the sides of the anterior cerebral vesicle, and which are known as the primary optic vesicles.

The optic vesicles at first have a wide opening into the brain, but they are soon partially constricted off, and

their narrowing stalks will develop into the optic nerve. The constriction which separates the optic vesicle from the brain extends from above and from the front, so that the stalk of the vesicle is situated at the base of the brain, and arises from the posterior region (thalamencephalon) of the anterior cerebral vesicle.

The external wall of the optic vesicle invaginates until it is completely inverted, recalling the manner in which a blastula is typically converted into a gastrula.

The epiblast of the head, which lies immediately external to the optic vesicles, becomes columnar, and invaginates as a rounded vesicle at the same time that the optic vesicle is introverted. The sac thus formed is the rudiment of the lens (Haddon and Kölliker). As this becomes constricted off, the outer skin again becomes continuous, and is eventually transformed into the cornea.

The eye at this stage consists of a stalked double-layered cup, containing a hollow sphere, and bounded externally by the skin. The cavity within which the lens lies is known as the secondary optic vesicle, or optic cup.

The lens does not grow so rapidly as the optic cup, and consequently is soon relatively much smaller, and comes to be embraced by the rim of the mouth of the cup.

The lens is thus an oval vesicle, with uniformly thick walls. Very soon the cells of the front wall become thinner and flattened, while those of the inner wall elongate and entirely obliterate the cavity of the vesicle. The latter cells early become strap-shaped and acquire their final disposition.

At no time is the wall of the lens more than cell deep.

The lens capsule is a cuticular membrane probably secreted by the epithelial cells of the lens.

The aqueous humour is a watery fluid which occupies the cavity between the lens and the cornea.

We have seen that the lens is a derivative of the epiblast, being a portion of it constricted off it. And, now, we will ask what the epiblast may be?

The epiblast constitutes the external skin of the embryo, and gives rise in the adult to the epidermis, together with those portions of the organs of active or passive defence which arise from the epidermis. It further gives origin to numerous glands, and also to the nervous system and to the sensory portions of the same organs. According to Haddon, the functions of this layer—the epiblast—may be summed up as protective, secretory, respiratory, sensory.

All this is very important as bearing

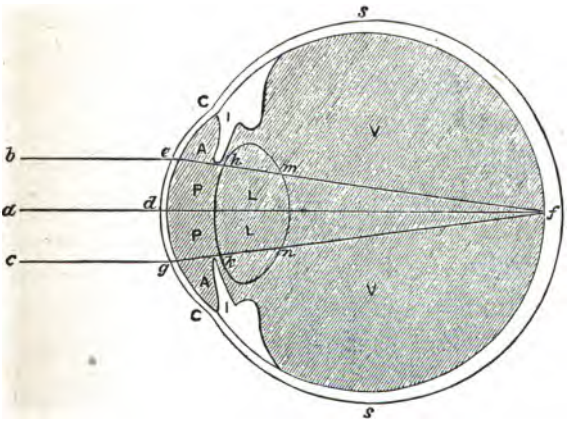
on the aetiology of cataract, as we shall see in due course.

There is an exceedingly able little book, by Dr. Dudgeon, entitled, "The Human Eye; its optical construction popularly explained," which any one of average intelligence and education can readily understand, and which I accordingly recommend to those who wish to know what the human eye is optically. The only part of the eye with which I am here concerned is the lens.

The following diagram of the normal human eye is from Dudgeon, with a portion of his explanatory text, for the remainder of the explanations see the work itself. I introduce it here to shew the optic use and importance of the lens, and to make clear what cataract really is, viz., *an opacity* of this crystalline lens, which opacity prevents the light from passing through to the peripheral point of visual perception.

Optical Diagram of the Eye.
(Dudgeon.)

S S is the hard, thick, opaque case called the *sclerotic*, which encloses the dioptric media of the eye. It is nearly spherical in shape, and lies in a hollow of the skull called the orbit, where it is



surrounded by a series of muscles which turn it in every required direction. This opaque case does not constitute a

complete sphere. In the front part of it is a circular opening, which is occupied by a firm transparent structure C C, more convex in shape than the case itself, and resembling a watch glass; this is called from its horny consistence the *cornea.* At a short distance behind the cornea there is suspended a contractile membrane I I, called the *iris*, with a circular hole in its centre capable of being made larger or smaller by the contractions of the membrane. The membrane is of various colours in various eyes; it gives what is called the colour to the eye. In the human eye it varies from light grey to the most intense violet blue, and from yellow through every shade of brown and hazel to the deepest black. Various shades of green are not uncommon. In the albino it is usually bright red. It is a perfectly opaque membrane, not allowing a ray of light to pass through it, except in the albino, where the absence of colouring matter renders it

not quite opaque. The circular opening in its centre P P is called the pupil.

The iris divides the eye into two unequal chambers filled with transparent media. That to the front, bounded by the cornea, contains a watery fluid similar in properties to the aqueous humour. That bounded by the sclerotic behind contains a fluid similar in properties to the aqueous humour, but enclosed in a finely reticulated membrane, which holds its fluid contents together even after removal from the eye, causing it to look like a lump of glass—hence its name, *vitreous humour*, V V. The refractive power of of cornea and aqueous and vitreous humours is nearly identical, and is very nearly the same as that of water.

Immediately behind the iris, bathed in front by the aqueous humour, and behind imbedded in the front of the vitreous humour, is a transparent double-convex lens-shaped body L L,

enclosed in an elastic membrane. This lens is called *crystalline lens.* It is composed of concentric layers of various refractive power, increasing towards the centre. Its average refractive power is not much greater than that of the aqueous and vitreous humours. While the index of refraction of the latter may be stated as 1·33, the average index of refraction of the crystalline lens is certainly not more than 1·39, probably less. The crystalline lens is commonly spoken of as "the lens of the eye," but this is misleading, for it is not the only nor yet the chief lens of the eye, but may rather be looked on as a supplementary lens, as far as the human eye is concerned, though, as we shall see hereafter, in certain other classes of animals it is the chief or even the sole ocular lens.

The curvatures of the two surfaces of the crystalline lens are not alike; thus,

its front is less convex than the cornea.*

I have now done with the descriptively introductory part of my task, and trust its simplicity may not deter any one from reading what follows. It seemed to me fitting to take thus a cursory glance at the anatomy and topography of the lens, and were it only *pour s'orienter*.

Definition of Cataract.

It will be sufficiently accurate for all practical purposes to say that cataract is the clinical fact comprised in the statement that the crystalline lens has

* The curvatures of cornea, and front and back of crystalline lens are usually stated to be as follows: the cornea has a radius of curvature of 8 millimètres, the front of the crystalline lens has a radius of curvature of 10 millimètres, and its back a radius of curvature of 6 millimètres; but as those surfaces are not spherical, these measurements can only be considered as averages.

lost its transparency in part or wholly, so that the passage of light through it towards the retina is impeded, lessened, or totally obstructed: in its normal state the lens is clear and transparent, but when it has in part or wholly become opaque we have the condition known as cataract.

The usual dictum almost universally accepted by the medical profession is that cataract cannot possibly be modified by medicinal means, but must be relegated to the ophthalmic surgeon who will remove the opaque lens, and so let the light into the *fundus oculi:* this is the point of view of the eye-carpenter.

My standpoint is that of the physician, and I say that while eye-carpentry is a good and useful thing in its way, for such cases as medicine fail to modify curatively, still the surgeon's knife must be considered only the LAST REFUGE of our art and NOT THE GOAL.

I will pass on now to a paper entitled,

The Causes of Cataract,*

With suggestions as to its prevention, which was presented for me to the American Homœopathic Ophthalmological and Otological Society, some time since. It is very short, so I will give it entire:—

Gentlemen of the American Homœopathic Ophthalmological and Otological Society: Your Secretary having kindly offered me the privilege of reading a paper before your Society at this present meeting at Indianapolis, I promised to avail myself thereof, and chose as my subject the Pathology of Cataract. But as time passed I felt that what I wanted to give expression to would be more

* Dr. Burnett's Essays p. 147. *Boericke & Tafel, New York, and Philadelphia.*

appropriately found under the present heading of my paper, viz.: "The Causes of Cataract, with Suggestions as to its Prevention."

It is well to cure by operation, it is better to cure with medicine, but prevention is better than any cure. But before we can prevent any given disease, we must necessarily first know its nature and its causes.

Let us clear the ground before us, and first agree as to what we are to understand by cataract.

In this paper I take the practical clinical standpoint and say:

Cataract is an opacity of the crystalline lens or of its capsule.

You will all agree to this, but you will say that the expression is too vague and loose, because there are lenticular opacities which are not cataract. Nevertheless I think it is sufficiently definite

for practical purposes. I do not admit that all intra-lenticular changes resulting in opacity must show themselves unyieldingly to treatment in order to be called cataract: such a limitation is not true to nature, and is not in consonance with the history of the word in general, medical, surgical, and ophthalmological literature.

However, I come before you to-day (vicariously, it is true) to give some ideas of my own, and as one seeking instruction from you. I want to ask you, gentlemen, whether the day has not dawned for an earnest effort to get at the true nature of cataract, and ascertain whether we must fold our hands impotently in its presence till it is like a ripe kernel in its shell ready to be enucleated, or whether we should fix our diagnosis *as early as possible*, to the end that our patients may have the benefit of our scientific therapeutics, and reasonably look for retardation,

amelioration, or even complete cure of that which threatens to shut out the light of day from them.

I rejoice to come before this Society to-day, even though vicariously, to lay before you a few thoughts and reflections that I hope may be accepted in a brotherly spirit, and yet subjected to the most searching criticism. If the little house I am about to build be founded in the quagmire of fancy, instead of being reared on the solid basis of fact, I pray you overturn it, every stone, before you leave to-day, and spare it not.

The True Nature of Cataract.

It is necessary to a right understanding of the subject that we have a clear conception of the essential nature of cataract, not merely as a pathological entity in a given *cadre*, but from a microcosmic standpoint: from the point of view of the entire economy.

Cataract is a general disease, *i.e.*, the opaque state of the lens is most frequently only a local expression of a general state.

To me an opaque lens existing by itself in an otherwise healthy body is inconceivable, except from trauma, or from mal-development, or from obstructed nutrition; but given a normally developed lens, not mechanically or chemically injured, it cannot of itself become opaque unless from some other part of the organism. It is barely possible to have a sclerosis of the lens and a supple elastic condition of the other parts of the economy. In a word the sclerotic change in the lens is of a piece with the state of the other tissues of the same individual at the same time.

If this be granted, then cataract is a constitutional state, and our remedial measures must be directed to the constitution, and they should be taken at

the earliest stages and continued for a long time, for chronic disease can only be cured by chronic treatment.

I was very much gratified to read in the last edition of Professor Angell's work, *A Treatise on Diseases of the Eye*, 6*th* edition, 1882, that ophthalmologists are beginning to take a broader view of the pathology of cataract. This eminent colleague says (p. 270) : "Recently, investigations, chiefly by Michel, in regard to the influence of the general circulation upon the nutrition of the eye, go very far to prove that cataract is generally caused by sclerosis of the carotid arteries. Thus in the course of ten months fifty-three cases of cataract observed showed a sclerosis of the carotid in every case. In some, where one eye only was effected, there was sclerosis of the carotid in the same side only, or it was more highly developed in that side, while in double cataract the opacity of the lens was most ad-

vanced on the side corresponding to that in which the sclerosis of the carotid was greatest. In addition to the sclerosis there was also in some of the cases an enlargement of the thyroid gland.' The ages of the patient varied from eight to eighty-one years."

Here I must object not to this statement in itself, but to the way in which Professor Angell puts it.

It is hardly correct to say that because sclerosis of the carotid accompanies cataract that, therefore, the lenticular opacity is secondary to the sclerosed carotid. I submit that cataract is itself a sclerosis of the lens, and that the hardened condition of lens and carotid is merely common to both, though the carotid may possibly degenerate first. I quite agree with Dr. Angell that it is not probable that every case of cataract will show a sclerosis of the carotid, and that there may be senile marasmus, or a feebleness of the

circulation after exhaustive disease, or congenital insufficiency of the arterial circulation, or abnormal growths pressing on the carotids—all and any of them as causes of cataract.

Some of the most frequent causes of cataract, are, in my opinion, gout, rheumatism, rheumatic gout, and syphilis, and here what benefits the gout or rheumatism will tend to better the cataract.

But the limits of my paper will not admit of my dealing with all the causes of cataract, and I therefore propose to confine myself more particularly to three that have not hitherto been brought before the profession, and to which I attach very great importance. I refer to

Salt,
Sugar, and
Hard Water.

I have watched cataract cases with great care for some years, and I am

prepared to maintain that the most frequent causes of cataract are the use of *much salt*, or of much *sugar*, or of *hard water*; very frequently we find all three causes operating at the same time in the same individual.

Gentlemen, before proceeding, allow me to say that I do not propose to *exclude* any of the other causes of cataract—no, I merely confine myself to these three as emanating from my own experience, and because I wish to call the very special attention of your learned Society to them. Then first as to

SALT-EATING AS A CAUSE OF CATARACT.

I lately published a little treatise entitled *Supersalinity of the Blood an Accelerator of Senility and a Cause of Cataract*, and in it I claim to have proved that an excess of salt acts as a positive cause of cataract.

The proof that salt will cause cataract in the lower animals has long been

given, and it has been my object, in the little work just cited, to show that not a few of the cases of cataract that we meet with are more or less due to the fact that the patients had been in the habit of partaking of too much salt with their food, or in their food, or perhaps even as a saline mineral water.

It will not be needful that I go over much of the ground again here, as I shall not have time, but I may just give the conclusions to which I have arrived, and a few points that lead up to them.

According to the experiments of Kunde, we find that certain of the lower animals to which salt has been administered, at once get cataract. Kunde's experiments were confirmed by other observers subsequently. Kunde says (*Ueber Wasserentziehung und Bildung vor-uebergehender Kartarakte*, 1857), if you take a frog weighing 30 grammes, and give it a 0.2-0.4 dose of

salt, either under the skin or in the rectum, you will, in a short time, observe a bulging out of the cornea, with an increase of the aqueous humor, and sooner or later, *an opacity of the lens*, which will begin, sometimes anteriorly and at other times posteriorly. This opacity increases in proportion as the animal gets weaker, and attains to such a degree at last, that the lens takes on a light ash-gray appearance.

And again: two grammes of rock-salt was introduced into the stomach of a young cat, and it killed her in three hours, *but the lens had turned opaque before death.*

Kunde repeated the experiment many times, but always with the same result, *the lens became opaque.*

Here, then, we find that common salt, administered to the lower animals, causes a development of cataract in them.

In his experiments Kunde was aided and controlled by Kölliker, Virchow, H. Müller, and Von Graefe. His experiments have been repeated by Köhnhorn, in Germany, by Weir Mitchell, in America, and by B. W. Richardson, in England, and amply confirmed.

I hope you will pardon my going over ground so well known to you all, but I want to bring out, very prominently, this important fact, that the common salt of our tables is a ready producer of cataract.

In my little treatise "*Supersalinity of the Blood*," etc., a copy of which lies before you, I take up this idea, and endeavour to show that not a few of the cases of cataract that come before us, have their origin in the excessive use of salt.

When too much salt is ingested, the blood becomes supersaline; when the blood is supersaline, its specific

gravity is raised, and the lens is deprived of its natural condition as a transparent body,—in fact, it becomes opaque. If this condition of the blood continue for any lengthened period, the lens must necessarily degenerate, and the cataractous state becomes permanent.

I have shown that very many cataractous patients are fond of salt, and I submit that the salt must, in not a few instances, be held responsible for the dried up, sclerosed state of the lens and other tissues of the body.

The physiological effect of salt upon our bodies is to dry up, to deprive of water, to harden, and hence salt makes us thirsty. This is, I hold, with Kunde, the essentiality of its action, Weir Mitchell and Richardson to the contrary notwithstanding

Let us now pass on to the next cause of cataract, viz., to

The Use of Sugar as a Cause of Cataract.

The experiments of Weir Mitchell, as set forth in a paper in the *American Journal of the Medical Sciences*, for January, 1860, show that not only salt, but also *sugar* can cause cataract. I have not read this paper myself, but only know it from Richardson's references to it. Hence I must refer to the experiments of Richardson that were undertaken to the same end, and gave a like result, *i. e.*, *sugar causes an opacity of the crystalline lens.*

When a patient comes to you, and you find the lenses opaque, the skin dry, the quantity of urine excreted large, the thirst great, and the specific gravity of the urine much increased—say 1040 or 1045—then you test the urine, and find it is full of sugar, and you say your patient has *diabetic* cataract.

Ophthalmologists were well acquainted with this clinically, long before science showed that saccharine cataract could be synthetically produced. I believe the honor of this discovery belongs to your country,—to America. But science knows no territorial frontiers, and no nation, and her fruits belong to mankind.

Although it has been so long known that the diabetic are apt to get cataract, and although it is more than twenty years since Mitchell showed that cataract can be induced in the lower animals by putting sugar into their bodies, yet I have not heard or read of any one carrying out the thought to its natural conclusion, and inquiring whether the dietetic use of much sugar could be charged with the power of inducing cataract in those partaking of it. Latterly I have directed some attention to this point, and from what I have observed, and

guided by analogy, I affirm that a certain number of cases of cataract which we meet with in daily life, are indeed due to the prolonged use of much sugar.

The diabetic cataract is not due to a primary disease of the lens; it is not due to the hepatic or neural lesion underlying the disease, known to us as diabetes; it is due to the presence of sugar in the blood of the diabetic patient.

When sugar is put into the circulation of animals, it produces cataract in just the same way as does the saccharine blood of the diabetic.

In like manner, when a person habitually partakes of sugar in considerable quantities, cataract may ensue as a direct physical effect thereof.

Gentlemen, if you doubt this proposition, just question your cataract

patients closely, and I believe you will soon come over to my view.

Of course it is not maintained that every large sugar consumer must necessarily develop a cataract; no, but let a person with some morbid proclivity, partake of a great deal of sugar as a general thing, and let a plus of this ingested sugar course about in his blood for a lengthened period, then it must be obvious that such a person *must* suffer from *sugar poisoning;* the sugar in his blood *must* develop its physiological effects, one of which is the formation of cataract.

For my part I see no escape from this conclusion. Do you ?

Hard Drinking-Water as a Cause of Cataract.

Not only do salt and sugar cause the lens to lose its transparency, and to become opaque, but many other substances produce the same result.

Thus Richardson enumerates the chloride of ammonium, the chloride of potassium, the lactate of soda, the carbonate of soda, the carbonate of potash, the sulphate of potash, the chloride of calcium, and the chloride of barium, as being likewise capable of causing lenticular opacities.

Thus it is evident that the power of common salt and of sugar to produce cataract is not by any means to be regarded as their peculiarly specific effects. In the words of Dr. Richardson, "It must be remembered, as the primitive fact, not only that the increase of the specific gravity of the fluids of the eye by *sugar* will destroy the refracting power of the lens, but that whatever soluble substance will increase the specific gravity of the fluids will induce the same condition." This gives us the key to a right comprehension of the causation of cataract, at least in many instances, and

certainly in a majority of them. The ergot cataract has probably a very different explanation, and so of others.

The specific gravity of *hard* drinking-water is higher than that of *soft* drinking-water. Hard drinking-water contains in solution various mineral substances, depending upon the nature of the ground through which it flows, lime in some form being the most common ; and half-a-dozen different substances may be found in solution in most of our drinking-waters.

When we inquire of persons suffering from cataract what kind of *water* is in use in their houses, we *usually* find that it is *hard ;* such is, at least, my experience.

If a person is in the habit of drinking *hard* water, *he is constantly imbibing that wbich is capable of raising the specific gravity of his fluids ;* and, according to Richardson's experiments, it must

follow that *hard* drinking-water must be capable of producing cataract. Of course this must have a general bearing, but we are here concerned only with the lens.

How often do we find that a cataract patient partakes freely of salt and salted provisions, of sugar and sweetened foods, and caps it all by drinking hard water !

Salt and sugar are both great producers of thirst, so that if a given individual takes salt and sugar freely he must drink freely to allay his thirst ; and if his drinking-water is hard, he is certainly taking the very shortest road to early physical degeneration and to the production of cataract, provided there be the least determining influence directing the fluid of increased specific gravity to his eye. And what shall we say if he be suffering from the modern mania of drinking mineral water !

The Prevention of Cataract.

My paper has doubtless already wearied you, and hence it is fortunate that what I have further to say may be epitomized in a few words. In view of these facts, I am in the habit of suggesting to persons suffering from cataract that they would do well to reduce their consumption of salt and salted provisions, as well as that of sugar, to a minimum, because both in excess can produce cataract. Also that *hard* water is to be equally avoided ; and if *soft* water cannot be got, the expressed juices of succulent fruits in a fresh state more than take its place.

In conclusion, my thanks to Dr. Park Lewis for his great kindness in reading my paper, and to you, gentlemen, for hearkening to it.

It will be proper that I should dwell a little more particularly upon the causation of cataract than in the

foregoing short paper, and I propose to take their causes *seriatim*, though briefly, and to begin with that caused by the commonest of all comestibles—*Salt.*

Cataract Caused by Salt.

"Hat man so vieles zur Zertheilung und Auflösung des Staares unternommen, und niemals über die Genesis desselben eine gründliche Nachforschung angestellt."—*Walther* (1810.) *

I shall have of necessity to quote largely and in bulk from my little work—"*Supersalinity of the Blood, an Acclelerator of Senility and a Cause of Cataract*," which was published in 1882.

Now in order to find out what a given thing *is* or *can do*, we want the most sensitive agents.

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* Abhandlung aus dem Gebiete der practischen Medicin besonders der Chirurgie und Augenheilkunde von Ph. Fr. Walther, Landshut, 1810 (p. 6).

At first sight, it would appear a very simple matter to determine the effects of salt upon the animal economy, or upon any particular part thereof; but experience shews that such is not by any means the case. In almost every thing absolute certainty seems unattainable: many think salt eating a necessity of life, while others hold that it is a very hurtful habit. Many big books have been written thereon, but a really scientific treatment of the question has, as yet, hardly been attempted.

To begin with, the same substance affects different individuals differently; if not in kind, certainly in degree. For, generally speaking, salt in moderate quantities—say ten or fifteen grains at a meal—is well borne by any healthy adult or big child. It is said that an ounce is usually a fatal dose. Certain persons are specially and peculiarly susceptible to the influence of

certain substances, and these are the very people to be used as test-agents.

As an example of a person having an extraordinary idiosyncrasy as regards salt, I will give the following:—A friend, who had read my little monograph *Natrum Muriaticum as Test of the Doctrine of Drug Dynamization*, mentioned to me that a clergyman in a London suburb was unable to eat salt as it made him ill. This clergyman was kind enough at my request to call upon me to tell me about it, and at my suggestion wrote out the following account of how salt affects him—

"London, July 21, 1879.—I have from childhood been unable to take more than a very moderate quantity of salt. Of course I must take some every day, in bread, potatoes, &c., but I never add any to my food from my salt-cellar, or miss it if altogether omitted; and I have to be careful to avoid everything which is over-seasoned with it. Of course, I am seldom, or never, "caught" now; and have to go back some years to remember the symptoms.

In the first place, I find it difficult by the taste to distinguish salt from pepper in soups, &c. Both taste *hot* to me. The next sensation is that of burning in the throat and gullet. This is followed by dizziness and nausea, swelling and discoloration under the eyes, redness of the face, and a feeling such as, I imagine, those who have taken an irritant poison would experience. Raw brandy or strong vinegar relieves the immediate symptoms by causing violent sickness, but it is not for twelve hours or more, in the case of a good dose of salt, (as from bathing in sea water,) that the system recovers itself, blood being frequently discharged both from the stomach and intestines.

"F. W....."

From this descriptive note it may be seen that salt is a very violent poison to this gentleman; that is his peculiar idiosyncrasy. Is salt qualitatively the same to us all, we being able to withstand it; or is this gentleman in a morbid state? He appears to be in good health.

But although my object in these pages is to study the physical effects of salt on the economy generally, still

this will be almost impossible unless we chose some special part of the body where its effect can with certainty be ascertained. For this the lens is peculiarly adapted as the sequel will prove; therefore instead of studying the general symptomatolgy of *Natrum Muriaticum* we will endeavour to shew how it affects the LENS, and, this done, we can deduce therefrom pretty certainly how it acts on the entire economy as a morbific agent, and this will give us also a therapeutic basis. Before proceeding I may be allowed to remark that the just-narrated case of salt idiosyncrasy demonstrates that a sea bath is a means of actually getting salt into the system. This point is of some importance, as the direct scientific experiment to prove it is all but impossible; but thus utilizing such a person with an idiosyncrasy against salt renders such experiment unnecessary. This proof that salt really enters the organism by means

of sea-bathing has a significant practical bearing, for we can now with certainty prescribe salt in this form. But salt likewise powerfully influences the body when persons live at the seaside. This may be seen by observing the effect of sea air upon *certain* persons. Salt causes in some persons a deep crack in the middle of the lower lip; this symptom stands in the Hahnemannic pathogenesis—I saw a marked example of this lip-crack in an ancient mariner at Brighton last summer. Certain persons cannot live near the sea,* as every observant physician knows. Some people get severe facial neuralgia at the seaside: they are commonly subjects of chronic psora. A lady of my acquaintance went last summer to Brighton with her children; she was quite well but rather low from nursing her sick children. The seaside

* At most seaside places there are plenty of examples of the condition called *Marine Cachexia.*

air quite upset her, and brought on facial neuralgia: she thus described her symptoms to me, "I felt as though I were full of salt water, and when I took a small dose of *Natrum Muriaticum* 6 it increased the feeling and filled my mouth with salt water. If I dipped my hands into the children's bath of sea water it made my neuralgia worse. My lips always tasted salt while I was at Brighton." This lady finally, at the end of three weeks, became so ill that she had to leave the seaside and return inland where she at once recovered. It is a common observation that some people get obstinate constipation at the seaside, while others get diarrhœa. I have also noticed that a long residence at the seaside will cause a severe form of anæmia in certain idiosyncratic and delicate ladies, who finally sink into the condition commonly known as "decline," unless they are cured medicinally or removed inland-wards.

Thus it is clear that "seaside" can be scientifically prescribed as a remedy.

Let us now return to our text. In studying the etiology and pathology of cataract some years ago, I went over the experiments of Kunde at second-hand. Latterly I have done so at first-hand, by procuring the important little reprint entitled *Ueber Wasserentziehung und Bildung Voruebergehender Katarakte von Dr. F. Kunde.** This "Abstraction of Water and the Formation of Transient Cataracts" should mark an era in the natural history of lenticular opacities. These important experiments were confirmed by Köhnhorn, † in Germany, in 1858, and by Dr. B. W. Richardson (The Synthesis of Cataract) two years later in England.

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* From the *Zeitschrift f. wissensch. Zoologie von C. Th. v. Siebold und Kölliker. Viij Band 4 Heft*, 1857.

† *De Cataracta Aquæ Inopia Effecta. Dissertatio Inauguralis Gryphiswaldensis, Anni* MDCCCLVIII. *—Auctor Conradus Köhnkorn.*

Intervening between Kunde and Köhnhorn and Richardson are the experiments of Dr. S. Weir Mitchell, as set forth in his paper in the American Journal of the Medical Sciences for January, 1860, these I have not read but they were, it appears, with sugar, and do not concern us here. More than twenty years have elapsed since Kunde did these experiments shewing that a form of cataract can be produced in the lower animals by the ingestion of salt, and yet I have never read or heard of their having raised the question as to whether this substance, which almost everybody eats with his daily food, may be accused of producing cataract or of otherwise deteriorating the general state of the human tissues This subject has occupied my mind at odd intervals during the past few years, and I have been trying to solve the problem. That salt will actually produce cataract in the lower animals has been experimentally de-

monstrated and experimentally confirmed. If, now, we could try the direct experiment on man, the question would be settled thereby definitely; but there are difficulties in the way: there are no human beings who would give themselves up for the experiment, and even though there were, it might be thought unjustifiable. Failing therefore, the direct experiment, we must proceed deductively and clinically. Cases of idiosyncratic persons are to me most instructive for I regard such as delicate re-agents of great value, but many will reject all such cases as unscientific and fanciful. They must, however, accept the data obtained by the direct experiment. Therefore let us start with a consideration of the experimental proof of Kunde that cataract can be produced in healthy animals by salt introduced into their bodies.

Kunde's Experiments.

Kunde enters upon his subject by remarking that the greater part of the earth's crust is made up of water, and hence it is no wonder that the products of this earth's crust, man and the lower animals, as the quintescence of earthly materials, should also consist principally of water. Wherever organic matter is to maintain itself, or the inorganic is to become organized, there must be water, for no chemical process can take place without its aid. *Corpora non agunt nisi fluida.*

Every animal, he asserts, is only in a normal condition when it takes up a definite quantity of water into its organs, and we should certainly get a clearer conception of many physiological and pathological processes if we were able to determine the quantity of water normally held by any given organ.

Whether we look upon water as a solvent, as imbibitionary material, or, probably, as a chemical agent, it plays such an important part in the functions of the organism that a plus or a minus of it must be of the greatest consequence.

But, unfortunately, we do not know how much water must be present to constitute the physiological norma.

We have been so long accustomed to look upon water as an indifferent body that we require to be reminded that water may be an exceedingly deleterious stuff.

Kunde then passes to a consideration of Eckhardt's Theory "that a concentrated solution of salt abstracts water from the nerves, and thereby causes twitchings of those muscles which they innervate," and suggests that a chemical action may have something to do with it.

A nerve deprived of too much water ceases to react, but *takes on its function again as soon as the necessary quantity of water is restored to it.* But too much water also deprives the nerve of the power of reacting.

Kunde proceeds to shew that if a living frog be deprived of too much water it dies. But if the process be stopped at a certain stage and the half-dried-up animal be placed in a moist atmosphere, it comes round again completely. The lethal point is not so much determined by the absolute quantity of water that is abstracted, but by the time occupied by the process; the organism can accustom itself to a considerable loss of water, provided it be abstracted slowly. To prove this Kunde instituted various experiments on frogs by drying them in a draught, or in very dry air, and then restoring the humidity, or not at will. If they were

kept in the dry they died, but if restored to a moist place they gradually recovered. But this drying process is a slow one, and so Dr. Kunde bethought himself of another and more rapid way of abstracting water from the living organism. He says, "There is a means of abstracting water from animals in a very short time, and that is SALT." He made use of rock-salt in substance, putting it either into the stomach or rectum, or under the skin. After its application the animals were convulsed* so violently that it almost approached to tetanus, but he only observed tetanus once in many hundred cases. The next important symptom to the convulsions was *sweating*, fol-

* Hence the homœopathicity of *Natrum Muriaticum* to certain convulsions. Query—Are the spasms of hydrophobia due to want of water in the nerves? The mode of death from hydrophobia is similar to that of a small animal from salt-poisoning; so are the *ante mortem* symptoms.

lowed by profound debility, exhaustion, paralysis, and death. When the salt was applied under the skin, a large quantity of fluid collected under the skin, but there was no such action in the intestines unless the salt was put either into the stomach or rectum. Put into the stomach it caused considerable hyperæmia of the mucous lining of the mouth, vomiting, secretion of bloody mucus from stomach and bowels, and the animal would soon cease to breathe. But if the animal was put into water all these phenomena soon ceased. We may fairly compare the effects of salt on these frogs and those symptoms observable in the idiosyncratic clergyman mentioned just now. And this is interesting also as bearing on the fact that salt, as we all know, causes thirst, for we can now see why it does so. Salt causes a loss of fluid, and it must be replaced, or mischief ensues. But even left in the air a frog poisoned with salt can yet come

round under favourable circumstances. Dr. Kunde's object with these experiments was not to study the effects of salt on the animal organism; but he was studying the effects of loss of water thereon, and he made use of salt as a rapid means of depriving the animals of this fluid, but in the course of his experiments he observed the formation of cataract as one of the effects of the salt, and he thus describes his important discovery (p. 9).

KUNDE'S GREAT DISCOVERY.

"If you take a frog weighing 30 grammes and give it a 0·2-0·4 dose of salt either under the skin or in the rectum, you will, in a short time, observe a bulging out of the cornea, with an increase of the aqueous humour, and, sooner or later, *an opacity of the lens*, which will begin sometimes anteriorly and, at other times, posteriorly. This opacity increases in proportion as the animal

gets weaker, and attains to such a degree at last that the lens takes on a light ash-gray appearance."

The value attached to this cataract formation by Dr. Kunde is primarily, because it affords a means of judging how far the poisoning with salt has progressed; for, says he, you can pretty well judge from the look of the lens in which stage of the poisoning the animal is, and whether it be still possible to stop the poisoning and restore the animal to its normal state. If not carried too far all the symptoms disappear when water is slowly restored to the organism, and then the salt cataract also disappears.

He concludes—"We can therefore succeed, by the alternative abstraction and restoring of water, in producing and causing to disappear, in the same animal, opacities of the lens and paralysis of the nerves."

And he thinks that the organs are only able to perform their functions when they have a certain amount of water, and that the presence of a superabundance of salt in the organism is not felt so long as it contains sufficient water. The nitrate of sodium has precisely the same effect on the lens as the chloride, but the nitrate of potassium does not, according to Kunde, cause any lenticular opacity.

Kunde is compelled, by the results of his experiments, to admit that salt is a powerful poison to the animal economy, or at any rate a very deleterious substance. How, then, is to be explained the fact that so many partake of such large quantities of salt without any *apparent* ill effects ? We say in English that habit is second nature, and the Germans express the same thing in their proverb, *Die Gewohnheit ist des Menschen Amme*, *i.e.*, habit is man's nurse ; and Kunde adopts Bichat's

saying *L'habitude émousse le sentiment* as explanatory hereof. At any rate we may learn herefrom the practical lesson that those who eat much salt must necessarily drink much fluid Therefore in the case of inebriates salt should be forbidden. And anyone may observe for himself that thirsty souls use much salt with their food. Now, Hartwig gave large doses of salt to horses, cows, and dogs, and observed the following phenomena: Convulsions, coldness* of the whole body, paralysis, and even death. Kunde noticed paralysis in the hind legs of guinea pigs to which large doses of salt had been given; and young cats, weighing from one to two pounds, would get vomiting, convulsions, paralysis, and even die from doses of only one or two grammes.

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* *Coldness* is a capital and characteristic indication for *Natrum Muriaticum* and which I have very often verified clinically, but, to be curative, it must be administered in dynamic dose. (See my little monograph on this drug.)

(Schüssler is, therefore, homœopathically correct in recommending *Natrum Muriaticum* in "vomiting of *watery* stuff.")

On the other hand, some people can undoubtedly partake of a considerable quantity of salt and seemingly remain in good health.

We may now note more fully the effects of salt upon the eyes of cats and other animals.

Two grammes of rock salt was introduced into the stomach of a young cat and it killed her in three hours, but the lens had turned opaque before death; the aqueous humour was increased; the iris was paralysed at the end of two hours, so that the strongest sunlight had no effect on the pupil.

Two other young cats, each one twelve days old, got each about a gramme of rock salt per rectum, and the anus being tied up; in two hours cataract had formed in each in both eyes.

Kunde repeated the experiment many times, but always with the same result: the lens became opaque. This may be a purely physical phenomenon or chemical. Kunde thinks it is due to the abstraction of water. In any case, it is certain that salt causes a beclouding of the lens-substance.

Let us now consider one or two of Kunde's experiments in detail; their study will repay the trouble—

A frog, weighing 54·5 grammes, had on Friday at 10-50 a piece of rock salt weighing 0·32 grammes put into its rectum, and was placed under a dry glass globe. The temperature of the room was 16° R. At 11-20 there was a beginning opacity in the anterior part of the lens (Linsenwand). Considerable secretion of fluid. At 11-55 considerable opacity of the lens. The frog was rather debilitated, but still hopped about. It was put into water. At 4-15 *status normalis*. The opacity

of the lens had disappeared. At 4-45 a fresh portion of 0·36 Cl. Na. was placed in the rectum and the frog put into the dry. At 5-35 considerable opacity in the anterior part of the lens. The animal was exhausted, for being placed on its back it had not the power to get up. Pulsation of the lymph-hearts barely visible. Heart beat and respiration still present. Sensibility much diminished. Its toes being sharply pinched it made a little jump. It was put into water. At seven o'clock the opacity had diminished and the animal was more lively. On Saturday morning at 8-40 the animal was in its usual health. No trace of opacity of the lens. Again 3·365 Cl. Na. put into the rectum. At 9-15 the opacity had again begun. At 10 o'clock the lens was ash-gray. The animal did not stir when laid on its back. Sensibility almost entirely lost, mechanical and galvanic irritation only fitfully responded to. The lymph-

hearts had ceased to pulsate. Heart-impulse no longer visible, but could be felt. No respiratory movements. The animal was put into water. Sunday morning at 7-30 the animal was in its usual health. There was just a trace of lenticular opacity at the back part, but this also disappeared.

Now let us give a couple of experiments with cats.

Two grammes of rock salt was put into the stomach of a cat weighing one pound four ounces. In three hours the animal was dead. In the interim an opacity of the lens had become developed, and on the surface of this opacity the usual tripartite figure could be seen. The aqueous humour was increased. Two hours after the salt was given the iris was already paralysed so that the strongest sunlight produced no reaction.

Two other kittens, each twelve days old, got each about a gramme of salt

put into the anus which was then tied up. Already in two hours cataracts had formed in both eyes.

These experiments were oft repeated and gave always the like result.

Kunde did not succeed in producing cataracts in coneys.

We need not follow these experiments any further; our point is proved: Salt is capable of producing cataract in frogs and cats.

Kunde finally concludes from his many experiments:—

1. A very slight increase in the quantity of salt in the blood is capable of producing considerable changes in the optic media.
2. The lens is being constantly changed.
3. The exchange of fluids in the lens extends to its deepest layers.

To those who know that Kunde in these experiments was aided and controlled by Kölliker, Virchow, H. Müller, and von Graefe, it will be quite needless to offer evidence confirmatory of his conclusions.

Köhnhorn's Experiments.

That this startling discovery of Kunde, that the ingestion of common salt is capable of producing cataract, should at once arouse further enquiry in science-loving Germany is what every one would anticipate. Accordingly we find the Westphalian student Köhnhorn going over the same ground soon afterwards choosing it for the subject of his graduation thesis which is entitled *De Cataracta aquæ inopia effecta* (Gryphiae MDCCCLVIII.) The eminent physiologist Budge led him to undertake the experiments and aided and controlled him. Köhnhorn arrives at substantially the same con-

clusions as Kunde: Salt introduced into the bodies of certain of the lower animals produces cataract of the lens, but he did not observe any increase in the quantity of the aqueous humour of the anterior chamber of the eye. With Kunde the cornea bulged out, supposedly in consequence of the increase of the aqueous humour, but Köhnhorn says he often observed that the cornea was very flat, and hence he concludes that the aqueous humour is diminished in quantity: those who are familiar with experimental pharmocology will understand that both conditions may obtain according to circumstances and idiosyncrasies. I will not detail the experiments of Köhnhorn, but will merely give one sample-experiment performed by him on frogs. (p. 10.)

Frog A, weighing 30·275 grammes got, *per os.*, 0·12 grammes of salt with the result that already in four hours the lens became opaque and the

opacity increased as time went on, and beginning sometimes at one part of the lens and sometimes at another and being in colour either snowy-white, yellowish, or ash-gray.

On the twelfth page of his dissertation Köhnhorn narrates the following very curious fact, which besides being very curious is also, from the standpoint maintained in this little treatise, especially instructive. He quotes from the *Ephemeris Guestfalica*, which I think means the Westphalian newspaper press, or it is perhaps a special publication. "Königshorn, March the 12th (year not given, but it is probably the year of the date of the thesis, namely, 1858). The Sesecke or Siske takes its rise above Unna and debouches into the Lippe near Lünen. This burn, at that part of its course which is near Camen, contains so many bleaks, or blays [Bleier] a kind of whitefish, that the inhabitants of Camen get a nick-

name therefrom. But now a circumstance has occurred which will render this nickname of doubtful application. Already as long as twelve years ago a spring in connection with our salt mine one day discharged such a quantity of salt lye into the Sesecke that the blays, which are solely a fresh-water fish, entirely disappeared. After years of litigation the owners of the salt mine had to pay respectively eight hundred and one hundred and twenty thaler damages to two owners of fishing rights in the Sesecke. The same thing has occurred again lately, but a great deal worse. The fish, not only blays, but also pike and perch, swim about as if stunned and can be caught with the most primitive kind of tackle. Single individuals having landed as much as half a hundred weight in one day. Experts declare that these fish are not stunned but *blind;* for when they hit against anything they at once seek to escape in the opposite direction. Ill

they certainly are for they can only stand this condition a few days, and then they die."

Köhnhorn opines that these fishes were first rendered blind by the formation of cataract, and then finally succumbed, and the large amount of salt thus conveyed to the river is credited with being the cause. Proved, of course, it is not; but it is extremely likely

Richardson's Experiments.

Before closing this part of our subject we will just glance at the confirmatory experiments of Dr. B. W. Richardson, F.R.S., who about the year 1861 published the results of his experiments under the title of the "Synthesis of Cataract." The copy from which I quote is apparently a reprint from a French source. The experiments were performed in 1860,

and Dr. Richardson's first communication on the subject was to the Medical Society of London in that year, but the first were with the sugars.

There is one important difference between these experiments: Kunde and Köhnhorn used rock salt in substance as we have already seen, whereas Richardson made use of saline solutions, so that Kunde's and Köhnhorn's results were not due to the anhydrous condition of the salt Let us take one or two of Richardson's experiments: On April 10, at 4 p.m., three drachms of a solution of chloride of sodium, of specific gravity 1.150, were injected under the skin of a large frog. The creature became immediately tetanic. The limbs were drawn up forcibly to the body; and in twenty minutes the whole body was fixed; at the same time there was a constant and general twitching of the muscles,—jactitation—which continued actively for an hour, although the

animal itself seemed to be really dead. Previous to death, indeed within fifteen minutes after the injection, there was opacity of the lens on both sides, and the lenses assumed a denseness and a peculiar whiteness such as he had not before seen. The appearance was more like that of a lens which had been subjected to boiling than aught else. On removing the cornea he found it clear and the parts surrounding the lenses also clear. On making section of one lens, it cut firmly, and the opacity was extended throughout its structure from the circumference to the centre. The other lens, submitted to water, became soft in structure but not clear.

On April 10th, at 4-15 p.m. two drachms of the solution of chloride of sodium, of specific gravity 1.150 were injected under the skin of another frog. The animal was immediately convulsed, and in twenty minutes was tetanic. Death occurred in a little more than

an hour after the operation, jactitation of the muscles continuing to the last. The opacity of the lens on each side commenced within half an hour after the injection, and continued rapidly to increase to total eclipse of vision. The change in the lens was identical with that which had been observed in the last experiment.

Richardson's other experiments had a like result, viz., the lenses became opaque, and the opacities slowly cleared up when the creatures were put into water. Other saline solutions likewise produced cataracts, viz., chloride of ammonium, chloride of potassium, lactate of soda, carbonate of soda, carbonate of potassa, and sulphate of potassa, but the phosphate of soda gave a negative result, as also did blood serum.

The chloride of calcium and the chloride of barium also rendered the lenses opaque, but the iodide of potassium did *not.*

Dr. Richardson also got Mr. Miller, of Bethnal Green, to place a pig under experiment for him, Dr. Ritchie making notes of it. The pig at the commencement of the experiment was in good health. It was placed alone in a sty, and was fed on the ordinary food for fattening these animals—a solution of common salt having been made, consisting of two ounces of salt in six ounces of water, one ounce of the solution was added to the food each day from the 18th to the 24th. From the 24th to the 30th one ounce and a half of the solution was given Up to this time it was observed that the animal, although taking food as usual, did not improve in condition. The crystalline lens in each eye continued clear. On May 1st, the dose of the salt solution was increased to four ounces daily, and on the 3rd to six ounces. On the 7th, four ounces of undissolved salt were added to the food, and this quantity was continued daily until the 19th.

The animal ate its food well and showed no sign of being affected by it. About the 11th Dr. Ritchie *thought there was some lenticular dulness*, but this effect soon passed off. The skin also remained free of blotches, and the strength of the animal remained as usual. The only change that could be observed was that he did not increase in weight and fatness like other animals fed at the same time and place on the same kind of food without the common salt.

Dr. Richardson's experimental summary is pregnant with significance from our present stand-point. He says: "It is to be observed that the success of the experiment in producing the cataractous condition turns on the specific gravity of the fluid injected. It required, in every example, that the specific gravity should exceed 1.045, in other words that it should exceed the specific gravity of the blood. But so

soon as a condition of the blood was attained, so soon as the circulating fluid could afford secretions, having an abnormal density, then the cataractous change was induced, and lasted so long as the blood retained its abnormal state."

We have seen that Kunde and Köhnhorn regard the lenticular opacities as due to mere exsiccation, but Richardson says: "The mode by which the cataractous state is produced must be accepted, I think, as osmotic in character, *i.e.*, as a direct physical effect on the lens through its surrounding and internal fluids, by which the arrangement of the lens, fibres, or tubes is changed. I have confirmed the observation of Dr. Mitchell that this effect is distinct from that of mere exsiccation." It is a pity that Dr. Richardson does not tell us *how* he wrought this confirmation; to my mind it is indeed an exsiccation, for, else,

why should the opacity disappear when water is added ?

And regarding the relations of these researches to cataract in the human subject, Dr. Richardson very sensibly remarks that no synthesis could be more perfect than that of cataract, and it is therefore impossible not to see that a relationship exists between the artificial and the natural disease. This is now admitted in regard to artificial sugar-cataract and diabetic cataract, but the production of artificial cataract by salt has heretofore led no one to suggest the possible connection of the salt-eating habit of mankind and the presence of cataract in the salt-eaters.

It is true that Dr. Richardson thus concludes: "Neither must we, in fairness, confine ourselves to the mere idea of sugar cataract from osmotic cause. It must be remembered as the primitive fact, not only that the increase of the specific gravity of the fluids of the eye

by *Sugar* will destroy the refracting power of the lens, but that, whatever soluble substance will increase the specific gravity of the fluids, will induce the same condition. THERE MAY BE THUS SALINE CATARACT AS WELL AS DIABETIC." [The small capitals are mine.]

Here we see that Dr. Richardson arrives at the possibility of the existence of salt-cataract by induction from his experiments on the synthesis of cataract aided by a knowledge of the long-known existence of sugar-cataract, but whether he is thinking of a saline cataract from a salt-disease of the body, analogous to the sugar-disease or diabetes, or of a salt-cataract from eating salt does not appear, but he must, I should suppose, have had the salt-eating habit in view, for salt is an inorganic substance and could hardly be made within the body. I may say that when I conceived the idea of this

little treatise I had never seen Dr. Richardson's *Synthesis of Cataract*, and I had nearly finished my MS. before I came across this remarkable sentence of Dr. Richardson's, "*there may be thus saline cataract as well as diabetic.*" It occurs to me to write to Dr. Richardson to ask what his meaning was, and if I get a reply before this quite leaves the press I will append it.

[I am glad to be able to clear this point up before this leaves the press. I wrote on January 30th, 1882, to this great physician and greater physiologist suggesting whether he meant that there must exist in man a salt-disease analogous to the sugar-disease or saccharine diabetes. Dr. Richardson very kindly at once replied to my suggestive query and for which I beg hereby publicly to thank him. The answer runs thus:

"25, Manchester Square, W.
January 31, 1882.

DEAR SIR,—You have correctly divined what I meant. I was of opinion, when I wrote the

paper you name (and I am of the same opinion still) that there is a cataract produced by the accumulation of some saline substance in the blood.

Faithfully yours,

B. W. RICHARDSON.

Dr. Burnett.]

This settles the point, for my contention is not that there exists a saline substance which, by accumulating in the blood, causes cataract; but that eating too much salt, or salt-containing food, acts upon the human lens *as salt*, just the same as the above narrated experiments shew in regard to certain animals. I do not admit the existence of any "saline substance" but I lay the blame upon the salt itself: its physiological effect is to dry up, and when any portion of the living tissue gets too dry, then, if the exsiccation persists, the vital state of the tissues is altered and morbid metamorphoses may ensue. It has long been clinically known that many diabetic patients suffer from cataract, and this variety is now commonly called diabetic cataract,

and its dependence upon a constitutional condition is admitted. It follows that diabetic cataract should be treated constitutionally, dietetically, and by medicines, and not extracted. This paper will throw some further light on the pathology of cataract tending also in the same direction. Let us, therefore, hope that we are near the dawn of a new era in the treatment of cataract generally.

THE PROBABILITY OF THE EXISTENCE OF SALINE CATARACT IN THE HUMAN SUBJECT.

Up to this point I have mainly considered the subject inductively; we will now pass on to its clinical aspect, and then draw our conclusions from analogy. We have noticed that the existence of diabetic cataract was long known clinically before Kunde, Köhnhorn, Weir Mitchell, and Richardson showed that sugar is capable of producing lenticular opacities.

When I first fell to working out the thought that *salt-eating* might play a part in the causation of cataract I had not yet, as before stated, read Richardson's surmise that there may be such a thing as *saline* cataract; and I did not then know whether he refers to salt-eating or not. His letter shews that he was not referring to the salt-eating habit of mankind but to some hypothetical saline substance accumulating in the blood, and as twenty years have elapsed since the publication of the "Synthesis of Cataract," it is evident that this thought has not yet borne any clinical fruit, at least, so far as I have read, no *saline disease* has as yet been demonstrated or even surmised except by Dr. Richardson. Indeed, unless the possibility of the curability of cataract by medicines be admitted and taught, and this is not the case, all the physiologists and bio-pathologists of the world will work in vain at its synthesis.

I was first led to surmise the possible connection of salt eating and *a variety* of cataract by the following incident:—

Early in the year 1879 I was conversing with a lady on the subject of salt eating; she had cataract of the right eye, and I had been treating her for it for a good while with no very great benefit, and she was telling me about the clergyman whose strange susceptibility to the influence of salt I have narrated. Observing that her right eye *watered* a good deal, I said, "Are *you* fond of salt?" and learned to my astonishment that she was extremely partial to it, *being in the habit of putting salt into her drinking water at dinner after the pudding.* As nearly as I remember she took almost a teaspoonful to a tumblerful of water! I recommended her to discontinue this practice on account of the power of salt to produce cataract in the lower

animals; she followed my advice, and her cataract at once began to improve, and six months later she could see quite well with the eye. She was taking *Dulcamara* 3 a part of this time. The *watering* of the eye was the first symptom to disappear.

It seems to me probable that her cataract was due to her salt-eating; but this, of course, cannot be proved.

According to Dr. Richardson's experiments, the formation of cataract begins as soon as the specific gravity of the blood has been raised above the normal sufficiently to admit of secretion and consequent osmotic change.

After this I did not think much of the part played by salt in the synthesis of cataract, but in taking the cases of cataract patients during the past few months I gradually got into the habit of asking my patients the question . . . Are you fond of salt? The answer to

this question is very frequently, though not always, in the *affirmative*. Let me give you some examples. I will not give very many—indeed I could not if I would, for I have not thought of the subject sufficiently long for that—because it will not be possible for me to *prove* my proposition. If I were able to bring a thousand such cases, it would still, at the best, be only a question of probabilities; however, the cases which I do bring have been sufficient to carry conviction to *my* mind. A conviction, namely, that inasmuch as salt can cause cataract in animals, it is barely conceivable that the same substance can be ingested by human beings in largish portions during many years with no effect at all. Granting that no effect was permanent in the animals so long as there was enough water within the organism to carry it off; still there must, in all likelihood, arrive a time when the input of salt will exceed the out-put, and

then human salt-eaters must necessarily be in the same plight as Kunde's frogs and cats.

First Observation.—Miss ———, fifty-two years of age, came under my observation in January, 1881, suffering from cataract of both eyes. It had been several years coming, and the appearance of the iris, a beclouded blue, is peculiar. *She is rather fond of salt.*

Second Observation.—Miss ——— about fifty-five years of age, came some time ago under treatment for cataract and very severe chronic dyspepsia. She had scars on the neck, and her eyes were very susceptible to the cold air. *As a child she was a very great salt eater*, and still eats it, but no longer cares specially for it. She was weaned of this excessive fondness for salt by the advice of a physician she thinks. Having taken such a large quantity of salt in her early years, and a moderate

quantity of it ever since, it is likely that the salt may have aided in the production of her dyspepsia and of the cataract. She is still under my care and improving a little.

THIRD OBSERVATION.—Mr. ———, has been under my care for several years, off and on, with hæmorrhoids, prolapse of the rectum and cataract of both eyes, much worse in the left. With his meat he takes "*Sunday Salt;*" he always eats salt, though not excessively he thinks. He is between seventy and eighty years of age, and otherwise hale and active, but he is in a very *mineralised* condition; and at his age, of course, everybody is more or less so. For many years he has been in the habit of drinking a strong *saline* aperient, a portion of every summer. If salt can cause cataract at all one might very naturally attribute that in this gentleman to its effect, for besides the daily

use of a "moderate" quantity, he must have imbibed many pounds of salt in his long-used *saline* aperient.

FOURTH OBSERVATION.—Miss——— seventy-four years of age, came under my care a short time since with a mature cataract of the left eye and an incipient one in the right one. She is very subject to diarrhœa and *eats a great deal of salt.* On July 21, 1881, I ordered her pilules of *Natrum Muriaticum* 30. One pilule night and morning. She, however, had to discontinue them as they upset her so much. She did not know what she was taking. She is a hale old lady, and fresh for her age. It might, not unnaturally, be objected to my theory—that much salt has a senescent effect upon the economy—that this case militates against it, or even overthrows it entirely. But I call attention to the fact that she is *very subject to diarrhœa*, and hence the organism may have cast

out the surplus of salt by the bowels, indeed must have done so to a large extent.

FIFTH OBSERVATION. — The Rev. ———, sixty-four years of age, came under my observation a short time since. He is a scientific man, and has devoted not a little attention to the eye and to optics on account of being himself the subject of cataract of both eyes. His case is one of very unusual interest, and I must notice that his eyes began to fail twenty years ago, and that he had *purpura hæmorrhagica* six years later. He is a great egg-eater, partaking daily of two regularly, and with each he takes a *small teaspoonful of salt.* Other than with eggs he is a moderate salt-eater only. But is it *probable* that two small teaspoonfuls of salt taken daily for a long period could have had *no* effect in causing the lenses to degenerate ?

SIXTH OBSERVATION.—Mrs. ———, sixty-one years of age, came under my care a few weeks ago with a skin affection, double cataract, dyspepsia, pyrosis, palpitation, and alopecia. As to *salt*, she tells me she is a *big salt eater*, partaking of two good salt spoonfuls at each meal.

Although not directly bearing on the present subject, still I cannot omit to interpolate here a note or two of a young lady whom I had long treated for complete suppression of the menses. Except this she complained of nothing beyond some indigestion. Having pre scribed various remedies with such scant success, I enquired very *closely* into her mode of life, and elicited the certainly interesting fact that she had been a very great salt-eater for eight or nine years. She eats about two teaspoonfuls of salt a day, and actually puts salt into her *coffee!* She is very chilly. The salt-eating habit of this

young lady may have had nothing to do with her menstrual suppression, but liking salt to such a degree that it is taken in coffee is, at least, a curiosity.

It will not be possible for me to give an exact scientific proof that salt-eating actually *does* cause cataract in man, but if I bring a certain amount of evidence tending to its proof, I may induce other practitioners to investigate the subject, and those who happen to have cataractous lenses, being largish salt-eaters, might leave off the habit and try the effect of the change.

I take here the opportunity of stating that practical information on the subject would be welcome to me. The question is too difficult for any *one* person to *settle*, but a careful and unprejudiced investigation of the question cannot fail to be of advantage to mankind and to science.

I will now return to my case book and give a few more observations on the subject of the coincidence of fondness for salt with the presence of cataract.

SEVENTH OBSERVATION. — Mrs. ———, *aet.* 61, formerly a patient of Dr. P——, came under my observation in September, 1881, with cataract of both eyes. She first noticed something the matter with her eyes five or six years ago, when Dr. P—— diagnosed lenticular opacities. She was waiting for the cataractous process to mature, when a friend of hers got cured of cataract under my care, and this determined her to try homœopathy in her own case. She had watched her friend's case, and would have sought the aid of homœopathy before, but her brother, an allopathic physician of standing, laughed her out of it. But I am digressing: Mrs. ———, has cataract of both eyes, worse in the

right, and *she is a big salt eater*, she *likes salt* very much, and *eats two good saltspoonfuls* thereof at a meal. Besides being fond of salt she is also partial to eggs and also to pepper. On my recommending her to give up salt with her food, she declared it would be impossible, as she was sure she could not live without it.

EIGHTH OBSERVATION.—Mrs.——— came to me in November, 1881, from a provincial town complaining of her eyes. She informed me that she had had rheumatic fever twice, the last time about five or six years ago. Ever after this last attack her eyes failed her, first the left and then the right one. Was for some time under Mr. B.——, who, eighteen months ago, diagnosed incipient cataract of both eyes, which is now readily demonstrable with the ophthalmoscope but not with the naked eye. Patient is now fifty-two years of age; is partial to sweet things,

and is *decidedly fond of salt*, eating, at a rough guess, about a teaspoonful of salt a day with her food.

NINTH OBSERVATION.—Mrs.———, *aet.* 62, came under my observation on December 1st, 1881, suffering from opacities of both lenses. She thinks they began four or five years ago after a carriage accident: the horses bolted, she became alarmed, and jumped out of the carriage and received a great shock to the cerebro-spinal system. She was long indisposed thereafter with notable neural symptoms. The drinking water of her house is very hard; she is very fond of sugar and consumes a good deal of salt, although she is really not partial to salt she says. But experience has taught me that "fondness of salt" may be in all good faith *denied*, and yet the person so denying the soft impeachment may in reality partake of a great deal. Thus Mrs. ——— says that she is *very* partial to

salt herrings, and eats a great many of them. Moreover she uses salt at every meal; she puts it on her plate, and, besides, she makes use of a *muffineer* (a salt cellar with a perforated top like a pepper box) and sprinkles salt upon her bread and butter and vegetables, &c. Her own estimate of the quantity of salt she consumes daily is one teaspoonful, but she does not admit any special fondness for salt. Of course it is not so much the *fondness for salt* that comes into consideration, but the *quantity of salt actually eaten.* Three hundred and sixty-five teaspoonfuls of salt eaten every year, and year after year, not to mention the *salt* herrings, may fairly be charged with the power of affecting the lenses, especially *after* a severe traumatic shock. Naturally I can *not prove* anything of the kind; the direct scientific proof is impossible, and trauma alone may have been the sole factor in the lenticular change. To my mind, how-

ever, it offers a certain amount of *vraisemblance.*

TENTH OBSERVATION.—Mr. ———, *aet.* 79, came under my care on August 24, 1881. Had been operated on for glaucoma two years previously. The whole of the lens of the left eye is opaque and looks whitish, that of the right partly so. Moreover, he is almost stone-deaf. He is highly mineralized —if I may so express myself. He is *fond of salt* and *eats a great deal of it* and puts *salt* into his morning tub for a long time past. He is a fine old gentleman, but from the feel of his pulse, which also intermits, and from his general look it is clear he is a moving mass of mineral. How much his salt-eating and salt-bathing may have conduced thereto I cannot say—perhaps not at all. But this is certain, there is improvement in his vision since I began to treat him ; he is *sure* he sees better, and his eyes do not tire so

readily. He has left off his salt *almost*, and thus far (Dec. 7, 1881) has had *Chelidonium majus* 1x; *Sticta pulmonaria* 3x; and *Pulsatilla Nuttaliana* 2. He has a little psoriasis of the lower extremities.

This having been delayed in the press, I am enabled to add a later note in this case from my case-book. While taking the *Pulsatilla Nuttaliana* his deafness almost disappeared, and the amelioration holds good. It was given because of œdema of the *left* upper eyelid. The intermittency of his pulse has disappeared, and he is fresher in his general look. On my advice he no longer puts salt into his morning tub, and has reduced his salt-eating to a minimum. I do not think it necessary to give it up entirely, because a certain quantity can without doubt be eliminated, and then it would not do any harm, and so enough may be partaken of just to give taste to otherwise tasteless food.

GLAUCOMA.

In connection with this tenth observation, it is to be noted that the eye-disorganisation *began* with glaucoma, of which he was relieved by an operation. Now, glaucoma has as its most essential character an increase in the ocular tension, presumably from fluid within, and in this old gentleman, there may have been salt-glaucoma as a start, with consecutive cataract. This is the more probable as the experiments of Kunde on frogs shew that the intra-ocular tension was first increased when salt was put into their bodies.

Another case of glaucoma that came under my observation, and that had been several times operated on by Mr. ——, once successfully on the left eye (which was then excised), and thrice on the right, which then collapsed;—this other case was one in which there were many remarkable features, and one was the lady's

excessive fondness for salt, whereof she partook very freely indeed. I treated her persistently with medicines and rigid diet, from which salt was *almost* excluded; and that one remaining eye is now a useful organ, sufficient for all the practical purposes of life, including reading and writing.

In fine, I am much disposed to charge the excessive use of salt with the power, in certain cases, of causing glaucoma as well as cataract. Let those whose opportunities are larger than mine prove that I am wrong.

ELEVENTH OBSERVATION. — Miss ———, *aet.* 50, by profession a teacher, came under my observation quite lately. She complains that the sight of her right eye is weak, *i.e.*, the right eye waters when she uses it a good deal. An ophthalmoscopic examination shews that the lens of this eye is diffusely opaque; the retina is only obscurely visible. Patient *is fond of salt;* she

eats it with most of her food. Although fond of salt, she does not like salty things. The aunt of Miss ——— has also cataract, and is even a much greater salt eater than Miss ———, as she even puts salt on her bacon. A lady on a visit noticed this aunt's fondness for salt and said "You should not eat so much salt, now you are old, as it dries up the blood." This is an example of how great truths are often current in the mouths of the people.

TWELFTH OBSERVATION.—Mr. ———, *aet.* 52, a hale and and hearty looking farmer, came at the beginning of the year under my care. Fourteen years ago had rheumatic iritis which ended in a closure of the pupils. Then iridectomy was performed by a provincial eye-surgeon of good repute; it failed. Subsequently a well-known oculist performed iridectomy four times with very indifferent results: as soon as each operation was done the part

inflamed and became opaque. There is, however, a rudimentary artifical pupil in the left eye and through this the left lens appears like a little whitish ammonite—a mere dried-up mass. With this left eye he can just distinguish between a horse and a cow, or between a pig and a sheep. It is eleven years since he last saw to read a little. What state the right lens may be in is beyond view, as the cornea of this eye is also opaque. *Patient is particularly fond of salt.* He thinks his daily average of salt is about two teaspoonfuls.

Thirty-six years ago he had the itch (caught from a servant); it was cured (?) by what he calls "a nasty stinking ointment."

The thought occurs to me very frequently that psora seems to taint many of the individuals who have cataract and are fond of salt: is the psoric

person specially susceptible to the influence of salt? And has he, also, a special liking for it?

Now, I think I may conclude this part of my little treatise; salt is capable of producing cataract in healthy lower animals, and I have shewn that persons suffering from cataract are very apt to be fond of salt. It may be said that fondness for salt, being present in many who have no cataract, cannot be any evidence that it really is to be blamed just because a cataractous person happens to eat a good deal of salt. This is granted. Yet I must submit that, quite apart from my little bit of clinical evidence, if salt can cause cataract in the lower animals, it may be fairly inferred that it possesses a like power over the human body. Phosphorus produces granular degeneration as well in animals as in man, and the sum of human experience tends to shew that drugs affect man and animals very

much alike. There are, it is true, notable exceptions, especially in the neurotics; but, put broadly, what causes tissue degeneration in animals will cause precisely the same thing in man.

Conclusions.

1. Salt causes cataract in the lower animals.
2. As many persons suffering from cataract eat a good deal of salt, it is probable that the salt may have some causal connection therewith.

The Effect of Brackish Water on the Eyes of Horses.

When I published my little treatise on "Supersalinity of the Blood, &c.," I asked my readers to send me any evidence on the subject of Saline Cataract of which they might be possessed. The following letter has, I think, some constructive value, and I give it without alteration—merely inter-

With this letter, kindly sent me by Mr. Charles Rees, I meant to close what I have to say on the subject of salt as a cause of cataract, but a few remarks on the rôle of salt in the organism will fitly follow here.

THE RÔLE OF SALT IN THE ORGANISM.

The experiments of S. Bunge, (son of the Professor) *Uber die Bedeutung des Kochsalzes &c. im menschlichen Organismus*,* seem to me of some importance as tending to the better understanding of the part played by salt in our organisms ; a subject thus far by no means sufficiently comprehended.

But before referring hereto I will just interpolate at this point, from memory, that I once read in an old Dutch thesis that *very small quantities* of common salt hasten putrefactive processes, whereas larger quantities

*Separat-abdruck aus der Zeitschrift für Biologie, Band. IX, Heft 1. München, 1873.

arrest putrefaction altogether.—This was proved by the direct scientific experiment, I cannot give chapter and verse as I have mislaid the little pamphlet. I mention this to shew that it cannot be merely a question of salt, but of *how much*. Bunge begins by laying stress upon the fact that only the herbivorous animals long for salt while the carnivorous ones rather dislike salt. Dogs and cats do not delight in licking salty rags or other objects, cows do, wild animals will wander long distances in search of salt as hunters tell us.

This is the more remarkable as the food of the herbivorous certainly does not contain any less chloride of sodium than that of the carnivorous. But the herbivore partakes of at least twice as much potassium as the carnivore, and the herbivore therefore needs salt in order to keep enough chlorine and sodium in the organism, because the

excess of the potassic salt in the food is a constantly working cause of the elimination of sodium chloride from the body.

Bunge comes to the conclusion from his numerous experiments that with our ordinary omnivorous diet the *addition of salt is not needed* (p. 35), while those who live mostly or exclusively on vegetables *must have salt with their food.*

I am not able to judge adequately of the truth or otherwise of S. Bunge's hypothesis, but his facts seem incontrovertible, and he himself fully admits that the attempt at explanations are purely theoretical. But, as he says, the fact remains that the salts of potassium abstract the chloride of sodium from the organism, and that it is only those animals, whose food contains so much more potassium than sodium, that shew a craving or liking for salt with their food.

Clearly therefore the question of kind of food must have a good deal to do with the great salt problem. And the part played by salt in osmosis gives the mode of feeding a direct bearing on the nutrition of the lens.

Sugar a Cause of Cataract.

And first of all, as to cataract in the diabetic; it has been long known and is disputed by no one. I will just add here a clipping from the British Medical Journal, January 31, 1885.

Diabetic Cataract: Spontaneous Resolution.

The subject of the following sketch was admitted to prison for fourteen days. On examination, it was found that he suffered from diabetes mellitus of eleven months' duration. He complained of blindness; this was due to

the presence of symmetrical nuclear cataract; both lenses were opaque throughout, the left more opaque than the right. He was put on the ordinary diabetic treatment, with the addition of opium daily. His visual power was almost lost, persons and articles appearing to him as black-looking objects; ordinary letterpress could not be seen either with or without spectacles. While under treatment, his sight began to improve; the opaque lenses gradually cleared; and, on inspection for discharge, it was noted that no trace of cataract remained. He was now able to read very small print with the naked eye. I am not aware of any statement as to the occurrence of fugitive cataract in diabetes. Dr. Warburton Begbie stated that, the sight once affected, no improvement ever took place. Turning to Juler's *Text book*, we find diabetic cataracts amenable to ordinary treatment, but no reference to the possibility of spontaneous cure. As to the pa-

thology of diabetic cataract, such natural recovery, to my mind, favours the idea of infiltration, rather than degeneration, of the fibres of the lens. Having regard to the production of large quantities of sugar in such patients, and the fact that sugar in the body is converted into fat, I should be inclined to recognise the product of such conversion as the efficient cause of the changes in the lens. I believe it is stated in some text-books that a large supply of hydrocarbon lessens the activity of respiration. Respiration is always less active in diabetics; the low temperatures observed in such cases seems to be an expression of this fact. In my patient, the average morning temperature was 96.8°; the evening, 97.4°.

The dryness of the skin and the crops of boils find explanation in the facts of development; the fibres of the lens, and the elongated cells of the

deepest stratum of the cuticle, being elements of the same series, probably both are alike affected.

T. F. TANNAHILL,
H.M. Prison, Wakefield.

Dr. Tannahill's concluding paragraph is peculiarly interesting to me, as it squares with my own views published in 1880 *.

As further corroboration of this view, I am now able to quote from a recognized authority in the ophthalmological world, viz., Dr. A. Mooren, of Düsseldorf. ("Hauteinflüsse und Gesichtsstörungen," Wiesbaden, 1884.) "All sorts of skin eruptions, when covering large surfaces, may lead to the formation of cataract. Similar observations have been made by Förster and Rothmund, the cases cited by the latter are in so far

* "Curability of Cataract with Medicines," p. 121, art. "Embryology of the Lens and its Capsule."

remarkable as they relate to the children of three different families, residing in as many different villages . . . In regard to the pathogenesis in these cases, Rothmund points to the circumstance that a connection exists between the lens and the skin, inasmuch as the formation of the lens proceeds from an invagination of the outer skin." (p. 32.)

" According to my (Mooren's) observations made thus far I must assume that the physiologically disturbed functions of the skin leads, through vascular reflex, to disturbances in the Chorioidea, and thence to the development of cataract." (p. 33.)

Mooren is also of opinion that prurigo and lichen produce a general condition that sets up a slow, lazy kind of chorioiditis, thus disposing to the formation of cataract.

Förster is quoted by him in the same sense.

Mooren is of opinion further that the rapid development of cataract in diabetes is due to lack of activity in the skin, and he remarks that the diabetic who maintain a moist skin suffer from visual disturbances much less than those who have a dry skin, and he cites cases in support of this view (p. 35.)

All this is in complete harmony with my own experience, and with my own already published views, which my colleagues will receive now, perhaps, with less incredulity. I will here incorporate a portion of what Dr. Richardson says ("The Synthesis of Cataract"):—

"In the American Journal of the Medical Sciences, for January, 1860, there is a paper, by Dr. S. Weir Mitchell, on the production of cataract in frogs, by the introduction of sugar into the system. It appears from Dr. Mitchell's paper that he arrived at his

facts in the following way. He was engaged in performing a series of experiments on the absorption of woorara through animal membranes. A solution of woorara having been enclosed in the stomach of a rabbit, the stomach was placed in syrup for two hours. About two drachms of the syrup were then injected under the skin of a pigeon, but no result indicating the introduction of a poison followed. One drachm and a half of the same syrup was next injected into the subcuticular sac of a frog. The frog died within five hours. An examination of the syrup having been made, it did not seem that any portion of woorara had been transmitted through the membrane to the syrup.

"Why then did the frog die? It occurred to Dr. Mitchell, that, as the amount of sugar employed in the case of the frog was very large as compared with the bulk of the animal, the sugar

might possibly be destructive to life when used as in the experiment named above.

"From this point Dr. Mitchell passed to investigate the effects of sugar on frogs, by injecting syrup in varying quantities into the subcuticular sacs. He was led thus to observe that sugar might really be poisonous under certain conditions, but he was led also to another fact: he was led to discover that a peculiar form of cataract was a constant attendant of the sugar poisoning and was enabled in a manner equally creditable to his own powers of observation, interesting to his profession and useful to the world altogether, to work out, at least in one direction, the "*Synthesis of Cataract.*"

"I had thought, on reading through Dr. Mitchell's paper, that in his labours a discovery entirely original was announced. In so far as he is concerned

I am sure the discovery was original, but I find that Kunde, some few years ago, travelled far in the same direction, and in fact established in a different way somewhat, a similar synthetical induction.

Having thus far introduced to the reader the pre-existing records on which the following researches have been based, I proceed to the history of certain experiments of my own, bearing upon the whole subject.

EXPERIMENTS WITH SYRUP OF CANE SUGAR.

EXP. I. On March 15th, 1860, three drachms of syrup of cane sugar, of specific gravity 1,270, at 60° Fahr., were put into a beaker with one drachm of distilled water. A small frog, the dorsal cuticular sac being laid open by two incisions, was placed in the syrup at 11-30 p.m. Previous to the experiment the eyes of the animal were perfectly clear. After forty minutes immersion, the creature was found, with the head above the solution, breathing regularly, but exhibiting languid movements. The web of each foot was extraordinarily reddened and con-

gested; the eyes were clear; at the end of the first hour from the commencement of the experiment, the languid condition had very much increased, and the body was greatly shrunken, there seemed also a redness over the whole surface of the body. A drachm more of water was added to the syrup. At 2 a.m. of the 6th (*i.e.*, after two hours and a half of the immersion) the langour was such that it was difficult to say whether life continued; but some slight movements were made on excitation; the lens of each eye was now distinctly opaque. The opacity seemed to be general and was of pearly whiteness. At 3 a.m. the opacity was more distinct. The frog was now dead: I removed it from the syrup and placed it in pure water. Returning at 10 a.m. of the 16th, the opacity of the lenses was found to have passed away altogether; and the lenses removed from the eyeball were beautifully transparent.

Exp. II. On March 16th, 1860, at 10 p.m., a fish (a minnow) was placed in six ounces of a syrup of cane sugar of a specific gravity of 1·100. At the end of twenty minutes the animal seemed nearly dead, but the syrup being reduced by the addition of water, to sp. grav. 1,050, the fish rallied and recommenced swimming briskly. Fifteen minutes later, it floated on its side and showed no voluntary movements; the syrup was

therefore brought, by the addition of more water, to a specific gravity of 1,025, when the creature again rallied and continued to live for the next hour and a half without any embarrassment. There was, at this period, no sign of opacity in the eye. The syrup was therefore raised to specific gravity 1,040. At 3 a.m. of the 17th, five hours after the commencement of the experiment, the fish was swimming livelily about, but the lens on the left side was markedly opaque; the right clear. The animal was obviously blind on the left side At 12-30 p.m. of the 17th, the same conditions were observed.

Exp. III. At 12-30 p.m. of the 17th, the fish rendered cataractic by the last experiment was removed from the syrup and placed in pure water. In six hours the opacity of the lens had almost entirely passed away. About noon on the next day, the fish, without any obvious reason, died. The lens was still a little opaque, and on removing it, the opacity was found to be situate anteriorly; at the point of opacity there was a slight depression.

Richardson performed many more experiments with the like results, viz.: *Cane Sugar causes Cataract;* and he proves the same of grape sugar, milk

sugar, mannite, liquorice,* and saccharine urine (diabetic). From all these truly remarkable results I deduce the practical lesson for the cataractous and cataractously disposed—USE SUGAR ONLY SPARINGLY.

CATARACT FROM LIVER DISEASE.

Although I have not the material at hand to *prove* that cataract, particularly that confined to the right eye, or begining there, may arise synorganopathically from a liver affection, I am nevertheless quite persuaded thereof in my own mind.

On the general question of the influence of the liver on the eye—"Uber das Vorkommen von Störungen des Sehvermögens neben solchen der Leberthätigkeit von Herrmann Althof und Heinrich Müller"†—we learn that in Birchoff's experiments on nutrition, a

* Extract of Glycyrrhiza glabra.

† Würzburger meds. Zeitschrift, II. Bd.

dog that had a gall fistula for four years, finished by having *atrophy of the retina*, probably starting from the choroid. Moreover, the vitreous was involved. There was also ulcerative keratitis. The lenses were somewhat affected, but were not duly examined. During life these said dogs suffered from amblyopia.

Ruete speaks of an amaurosis icterica, not due, however, to the taking up of bile coloring matter.

Köchling mentions a case of haemeralopia of some weeks duration, connected with swelling of the liver, which haemeralopia disappeared when icterus set in.

Chelidonium is beyond any question an hepatic, and has rendered me very important help in the medicinal cure of cataract.

We call to mind also in this connection, that the *liver* is the normal sugar maker of the organism, and may on this account claim special therapeutic attention.

Cataract Caused by Excess of Albumen.

After I became acquainted with the causation of cataract by salt and sugar, synthetically produced, I made diligent enquiries of all my cataract patients as to their mode of living, and as to their favorite articles of food and drink. It soon became evident to my mind that certain patients had produced, or hastened, or intensified, their lenticular opacities, by eating overmuch sugar or salt; but I also began to remark that a certain number of them were inordinately fond of eggs. At first I did not much heed it, but as examples began to multiply, I began to ask myself the question whether too much albumen in the blood might not also be a cause of cataract. I ransacked literature to find some evidence on the subject, but found none. An *albuminous cataract* was not mentioned, and yet I am firmly

persuaded that too much albumen in the blood is a cause of a certain kind of cataract.

When we reflect that the newest chemical analysis of the lens shews it to consist of:—

Water	60 % — 63 %
Albuminoid substances	34 „ — 37 „
Lecithin...	0·23 „
Cholestearin	0·22 „
Fats	0·29 „
Soluble salts	0·59 „
Insoluble salts	0·19 „

And further, that any change in the physico-chemical composition of the lens may cause opacification, we can readily understand that there may be a cataract due to albumen in the blood, just as there is a diabetic cataract.

Michel * mentions the fact that the humor aqueus is more than normally

*Lehrbuch der Augenheilkunde, von Dr. Julius Michel, Wiesbaden, 1884 (p. 325.)

rich in albumen in certain pathological states, and also refers (p. 341-2) to "cataracta nephritica," this, however, is in connection with Bright's disease from arterio-sclerosis, and is the analogue of the cataract of diabetes mellitus. My point, however, is that there are certain people who induce cataract by ingesting too much albumen and albuminoids, as for instance by inordinate egg-eating; this being the analogue of too much sugar-eating—sugar and saccharine substances.

And Michel says: "Anything that causes coagulation of albumen will tend to produce opacification of the lens" (p. 324.)

This *may* account for the cataract of glassblowers and others who work in *great* heat.

Cataract Caused by Hard Drinking Water.

I possess but very little direct evidence of the capability of hard drinking water to produce the cataractous state; but of circumstantial and presumptive evidence I have a good deal.

It must be remembered that any soluble substance that is capable of raising the specific gravity of the blood tends to the formation of cataract. One fact I will adduce, viz., cataract is more common in some districts than in others; and there is but little doubt in my mind that the persistent long continued use of very hard drinking water tends to produce arterio-sclerosis, Bright's disease, common cataract and nephritic cataract, the process being a general one of silting-up of the arterioles with lime, &c.

But this must not lead us to the use of rain water or distilled water, which is again *too soft*, and which produces an even more rapid mineralisation than water that is too hard.

I have distinctly observed that the prolonged use of rain water is disastrous to health—leading to premature senile decay. The proper drinking-water is one that is neither soft enough to oxidise too vigorously nor hard enough to clog and silt up — in fact, an indifferent fluid to act as a solvent and carrier.

Very soft water is a *medicine*, not a wholesome beverage; *hot* water is also a *medicine*; both should be used medicinally and with judgment.

Cataract Caused by Mineral Waters.

The use of mineral waters has been known to cause cataract. Cataract has

been cured by the waters of Carlsbad over and over again. Probably no one knows more of Carlsbad waters than Professor Seegen, who is my authority for this statement.

Cataract Caused by Alcohol.

In former times a noted operator for cataract was in the habit of recommending his patients to drink spirits so as to hasten the maturation process. Here are Richardson's experiments :—

Experiments with Alcohol.

Exp. LXI. On April 11th, one drachm of absolute alcohol was injected under the skin of a large frog at 6 p.m. At 8 p.m., the animal was dead with the most extraordinary shrinking and collapse I have seen. There was posterior lenticular opacity on both sides.

Exp. LXII. Half a drachm of absolute alcohol was injected under the skin of another frog on April 11th, at 12m. At 6 p.m., the

animal was dead with great collapse of the body and dryness of the surface. There was well marked opacity of the lens on the right side. The lens on the left side was clear. There was no further opacity produced after death.

Exp. LXIII. On May 21st, at 1 p m., 20 minims of absolute alcohol, mixed with 40 minims of water, were injected into the subcuticular dorsal sac of a large frog. At 2 p.m. the animal was dead with great collapse of the tissues. Preceding death there were occasional convulsions of the posterior extremities; the convulsions could be excited by pricking. There was no sign of lenticular opacity either before or after death.

Exp. LXIV. At 1-5 p.m., on the same day, 15 minims of absolute alcohol with 45 of water were injected under the skin of another large frog. At 2 p.m., the animal was dead with intense collapse. The death, as in the previous case, was preceded by convulsions: there was no opacity of the lens.

Exp. LXV. On May 21st, at 1-10 p.m., 5 minims of absolute alcohol with 25 minims of water were injected under the skin of a frog. At 2 p.m., the animal was dead. There was in

this case no convulsions, but collapse was not less manifested. There was no indication of lenticular opacity.

Exp. LXVI. On the same day and at the same time five minims of absolute alcohol with 25 minims of water were injected under the skin of another frog. This and the previous animal were placed in precisely similar conditions. At 2 p.m., the animal was still alive, but very feeble. At 3 p.m., it was alive. At 5, it was recovering from the prostration. The animal ultimately recovered, giving no indication of opacity of the lens.

We here note that concentrated alcohol causes cataract but that *diluted* it does not. This point is important as it saves us alike from a silly extreme of abstention and from an equally unwise indulgence.

Naphthalin as a Cause of Cataract.

"M. Bouchard made a communication for M. Charrin to the Paris Academy of Medicine, in connection

with some experiments made on animals with napthalin. The drug was administered to five animals, in two of which cataract appeared in from three to twenty days. The animals received a dose equal to one gramme for each kilogramme of their weight."

This notice has gone the round of the medical journals but I have not read any details of the experiments.

I might add that Naphtha was at one time in England credited with the power of *curing* cataract.

Organismic & Local Causes of Cataract.

There are certain general causes of cataract that for convenience sake I will call organismic, and they are indeed manifold.

What Michel says on this subject is weighty (Michel is professor in the University of Würzburg, and his authority no competent person will question) on p. 330, of his by me already oft-quoted *Lehrbuch* I read:— "The causes of lenticular opacities are manifold. Facts more and more compel us to recognize the clinical importance of a cataract in its being the earliest and most striking expression *of a general disturbance of the nutrition.*

Lacking direct local cause for the double-sidedness of cataract, such a state speaks for a general cause. In each individual case of cataract we must make an exact examination of the patient's appearance, bodily constitution; we must consider the state of his circulatory system, we must make frequent and repeated examinations of his urine as to its specific gravity, and as oft test for sugar and albumen.

In a number of cases local disturbances of the circulation and diseases of the eye, particularly of the choroid, will account for the cataract. Many of the causes are unknown, especially is this the case with congenital opacities of the lens.

Both in general and local disturbances of the nutrition we must assume that it is a question of changes in the fluid of the lens either as to quantity, unequal distribution or chemical composition. In the osmotic processes which take place not only between the lens as a whole and its surroundings, but also between the fluid of the tissues and each separate lens-fibre, we may surely expect that a change of quantity will bring with it also a change of chemical quality.

The influence of altered tissue-fluid in itself will produce different clinical pictures according to the stage of

growth and of sclerosis in which the lens thus hurtfully hit happens to be. We shall also have to consider the rapidity with which the damage is done, to what part, and we must also not lose sight of its morphological relation hereanent; this of course relates only to the lens in an entire undamaged capsule, for if the latter is wounded we shall have to look to the possibility of the entrance of the various foreign constituents."

With this broad philosophical and scientific conception of Prof. Michel of the causation of cataract we look with keen interest to his views of treatment, and what do we find? We find a bare admission of the possibility of a medical therapeutics of cataract and an entire reliance upon—the knife!

Might I ask this able man what is the use of all this diagnosing if we are always to have only the knife as a remedy?

The knife is and can be no remedy, it is only a refuge of despair.

Michel tells us to examine for anterio-sclerosis, for albumen, for sugar, for organic and constitutional disease, and then leaves us to the knife, to the knife, to the everlasting knife! And yet Michel is a master of masters in Ophthalmology!

Still it is something that he does not throw ridicule upon a better therapeusis as do most of the merely eye carpenters in whose tender hands we fall when our eyes grow dim.

Abdominal Amaurosis.

Dr. I. N. Scherrer many years ago published a very interesting case shewing the possible connection of the eye with the spleen and the urinary

organs * *Pulsatilla, Arnica, Antim. tart.* and other remedies were used mixed together, so it teaches but little, but the strangury and priapism, as also the blindness, were cured, and the tumour lessened in size. And the connection of the spleen, urinary organs and eye, is evidently demonstrated.

Diseases of the Skin in their causal Relations to Cataract.

My little work "Curability of Cataract with Medicines" so often referred to, concludes thus :—

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* Amaurose (abdominale) presque complète de l'oeil droit ; amblyopie considérable de l'oeil gauche ; tumeur très—volumineuse dans l'hypochondre gauche se prolongeant jusqu'à l'excavation du bassin—Coïncidence remarquable d'une affection symptomatique des organes génito-urinaires. Guérison complète de l'amaurose après la disparition de celte dernière affection.

Gand, 1842.

Psora as bearing on Cataract, from a Therapeutic Standpoint.

The expression *Psora* means different things to different minds. In the Hahnemannic historico-pathological case-taking it plays a most important part. Here its true appreciation is of the utmost significance and incalculable range.

Psora may not, perhaps, express an absolute truth, *but it is of extreme practical worth.* It must not be regarded as synonymous with the acarus disease, although it may be, possibly, included in it. As far as I understand the subject, it has not any more to do with scabies than with eczema, psoriasis, rhagades, phthisis, or cancer; but psora is the soil in which these weeds thrive, the psoric individual is their appropriate host.

Those who ridicule the Hahnemannian doctrine of psora, believing it to be synonymous with the acarus malady, are right and wrong: right in refusing to subscribe to the teaching of such identity merely, but wrong in supposing that Hahnemann ever taught so. At least I cannot see that he does so in the original.

The mucous membrane in its entirety and the common integument must be looked upon as homologous: what is on one to-day may appear on the other to-morrow, and conversely.

Metastases from the one to the other are most frequent. Both are dermoido-epithelial structures; and, for me psora means a constitutional crasis that manifests itself as a disorganization of some portion or portions of these homologous structures, whereby we may have ITCHING when it is on the outside.

We have seen that the lens is *differentiated* skin, a dermoido-epithelial

structure; and hence cataract may well be conceived as being a metastatic, or primitive, psoric expression. This I conceive to be the *Hahnemannic Pathology* and *Etiology* of *Cataract*. On this line cataract is curable with medicines. Further, I submit that this is pretty clearly demonstrated in quite a number of the cases of cure that I have cited and narrated.

It is vague, I admit; neither would I maintain that it is an absolute truth; it certainly requires reading of books *and of nature*, and some reflection withal. But the willing mind, with fertile receptivity and docility, may in this wise get behind, and beyond, and under many otherwise inscrutable forms of disease, and he will be thus often enabled to *cure* what, from any other standpoint, *seems* hopelessly incurable.

It would lead me too far (and this is not the place), were I to attempt to

follow this up and to elaborate it. *A une autre fois.*

I have myself, obtained more insight into the doctrine of psora in working at this "Curability of Cataract with Medicines" than I ever before could; the light—crepuscular only as yet—is, nevertheless, better than the darkness of despair.

> *"Censeurs savants, je vous estime tous;*
> *Je connais mes défauts mieux que vous."*

I have not space enough to follow up and elaborate the psora-idea as bearing on cataract, but I will just make a few remarks.

Much wider reading of the literature of the time of Hahnemann leads me to the conclusion that what I have elsewhere called *the Biopathology of Hahnemann*, *i.e.* his psora, syphilis, and sycosis is in reality the dogmatic fixation by him of the views of his time. When a man has been practically ac-

quainted with homœopathy for a few years, he finds that he cures in a very swimming manner a very large number of cases of disease, and he is grateful to the man and to the law that have helped him: presently he notices his *failures* a little more, and perhaps fails in just the cases he most wished to cure.

He treats for instance a case of tubercular meningitis with Belladonna with eminent relief to all the symptoms and he feels grounded in his homœopathy all the more surely; but the patient eventually dies of the tuberculosis nevertheless, and the physician, as he thinks the matter over, comes to the conclusion that he cured the cephalic congestion ONLY with Belladonna; and why? Just because there is *no* pathogenetic relationship between tuberculosis and the Belladonna-action *other than the congestion.* In sum: Belladonna is *not truly*, only superficially

homœopathic to tubercular meningitis, and he must perforce go in quest of a pathology. That, I take it, is where Hahnemann was when he fixed upon psora, syphilis, and sycosis as the essentials of pathology; his experience drove him to *some* pathology. The dogmatic limitation of pathic geneses to these three states is not true to nature; The facts expressed are *truthwards* all the same, and so far as they go truth itself, but the limitation is not as nature shews herself to me; indeed few can accept it.

It is *not true* that most chronic diseases are due to psora, syphilis and sycosis; it *is* true that *many of them are.*

But I am here not concerned with the wider bearings of this doctrine; I must try to keep as near to the causation of cataract as possible, and I will go back to a very distinguished contemporary of our great master who had special experience of cataract, and

who was a friend of Hufeland, as was Hahnemann himself, and whose pathological views are indeed Hahnemannic. I refer to Ph. Fr. Walther, Professor of Physiology, Surgery and Surgical Clinique at the Ludwig-Maximilian University at Landshut.*

Walther's first "Abhandlung," or Essay is entitled *Ueber die Krankheiten der Crystallinse und die Bildung des Staares*, that is, on the Diseases of the Crystalline Lens, and the Formation of Cataract. He says (p. 49) :

"How very manifold the mode of origin of cataract may be is clearly seen from its metastatic origin. There is hardly a single disease which may not result in an opacification of the crystalline through its morbid process being carried to the lens from another organ.

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* Abhandlung aus dem Gebiete der practischen Medicin besonders der Chirurgie und Augenheilkunde 1810.

Burghardt mentions a cataract that developed suddenly in a man who washed his head with cold water while he was suffering from coryza. Cataract arises from repelled itch (Krätze-psora) and from impetiginous and other exanthematic activities becoming fixed in the lens; it arises from the untimely healing up of old foot sores (bad legs), from suppressed catarrhs, from irregularly flowing hæmorrhoids, from suppressed menses, even from suppressed agues, from insufficient crises in fevers, from flying gout, from inveterate syphilis, &c. Now whether this metastatic origin of cataract consists in a transfer of morbid activities and pathic reactions from one organ to another according to the law of consensus and of reciprocal relations; or whether morbid products and disease-stuffs themselves pass through the lymphatics, or by other ways of communication, to the lens itself, certain it is that in both cases the morbid irrita-

ments or materials set up inflammatory reaction in the organ that suffers secondarily and metastatically. When the eruption of Scarlatina disappears from the skin by retropulsion, when an erysipelas of the face goes pale, we often get an inflammation of the meninges, of internal membranes generally, particularly of the serous and mucous ones. According to Corvisart pericarditis is frequently an herpetic, a psoric inflammation; suppression-diseases often cause consumption of the lungs, which at the beginning is always of an inflammatory nature, so that even the metastatic origin of cataract proves its inflammatory nature. Hence is apparent the great susceptibility of the body, and of the capsule of the lens, to the most varied diseases. For the inflammations of internal organs, arising from suppression-diseases, are not simply inflammatory, but rather of a specific nature and constitution."

The following incomparable passage I must leave in its beautiful original (p. 52): "So wie ein jedes Organ an dem Einen und selbst-gleichen Leben des Leibes Antheil hat, und so wie das Leben in der Linse, der Substanz nach und in dem ewigen Grunde betrachtet, kein anders ist als in der Haut, und im Muskelfleische, so ist auch jedes Organ, wie unscheinbar es sey, aller Krankheiten fähig. Das Auge hat keine anderen Krankheiten als der Knocken, und die Lunge: und es ist in keinem Gliede des lebendigen Leibes irgend eine Krankheit, welche nicht unter gegebenen Bedingungen im Auge hervortraete." And further (p. 53): "The beginning of cataract in the arthritic, syphilitic, psoric, exanthematic affections of the lens have not heretofore been regarded in this light; still it is known that cataract is developed in all these diseased states, and each in its own way, &c."

This wide philosophic view is eminently Hahnemannic, as homœopaths understand the term; in other words, the thinkers of Hahnemann's time had a causal *x* of a peculiar nature; psora, or the itch-disease, these thinkers all admit, and the itch does, no doubt, poison the blood and produce skin diseases, and therefore cataract, secondarily or metastatically.

The general blood and tissue poisoning and depraving influence of the syphilitic virus is everywhere patent and admitted, and need not be dwelt upon. Sycosis I will not here treat upon, but will say that the psora of Hahnemann and of his contemporaries and forerunners represents not merely the itch-disease, but a whole host of skin-diseases—from leprosy onwards; and by psora is practically meant a constitutional affection of and in the skin that may affect any internal part, and that permeates every portion of the body as a veritable morbid crasis.

While the term is too vague on the one hand, and on the other hand is often fancifully and dogmatically limited by homœopaths, it expresses so much that is truth and is yet so ill-defined that we do not know where we are. We shall in the end have either to give up the word psora or define it. What we want is a word that shall express the fact that, *e.g.*, lepra in the skin may affect the lens and be there called cataract, and that what is cataract in the lens may be, *e.g.*, lepra on the skin: the one taking the place of the other is well-known as metastasis, as Walther so well puts it.

The word *acariasis* I find in old works of Hahnemann's time, and I can but think that it would be well to use it now to mean the general constitutional disease engendered by the itch-insect; the experiment of Bourgignon, who comminuted some acari and injected

the product under his own skin, shews conclusively that acariasis is no myth but a pathologic fact, and that acariasis is a genuine somatosis—if I may coin a word.

But psora seems to mean more than acariasis : it is used as equivalent to the various internal and external morbid states that shift about from part to part. These states are so ill-defined that we do not know where we are ; throughout our vast literature it is a peg on which so much has been hung that it would be best to give it up altogether.

If we accept syphilis and acariasis as two well-known constitutional vital poisonings, we should be able to classify the other facts of so-called psora when we know what they are. As for sycosis, it needs an entire re-handling in the light of modern science.

In any case the psora of Hahnemann must be split up into its com-

ponent parts, and a first step would be to reckon with the itch-insect as a poisoner of the entire organism through the skin, and the already-used term acariasis might well express it.

When we bandy about with words such as *psora*, *dartres*, *Flechten*, *tetters*, *the herpetic diathesis*—we have no clear conception of the limitations of what we mean, and are explaining the unknown by the unknown.

I shall use the word *merosis* to signify a local affection, and the word *somatosis* to mean a disease common to the organism. As examples I will cite gonorrhœa (as now currently accepted) as a *merosis*, *i.e.*, it is held to be strictly an affection of the urethra, whence it does not invade the organism of itself, while syphilis and acariasis I name as somatoses, *i.e.* they affect the entire economy from their original starting points. I think these

terms, merosis to express a local affection, and somatosis to designate a constitutional disease, very desirable and convenient, and I hope they may find general acceptance. In any case I shall use them when needed in these pages in the sense just explained.

I hold that cataract may be either a merosis or a somatosis, *i.e.*, it may be a primary affection of the lens, or a constitutional disease located in the lens, or it may be merely a malnutritional local or general state.

I will here quote a few pages from my little treatise entitled "Diseases of the Skin from the Organismic Standpoint."

Ringworm of Scalp—Cataract.

At the beginning of 1883 a boy of six was brought to me, from Yorkshire, with opacities of both lenses. The

failing of his sight was first noticed in 1881. Had been under an oculist of repute who had given some drops to be put into the eyes, but these drops could not be used after the first instillation, as they "made the child like a dead'un for days." Has been delicate all his life, and notably worse since the measles in the summer of 1880.

Had ringworm of the scalp in the summer of 1879, which was cured by internal (probably tonic) and external treatment. The father says he is "wick," which he explains means *lively*. After four months of Sulphur 30, and then of the 200*th*, this report came—"My boy is still improving with his eyes slowly; they have not that large glaring appearance; look more natural, and he has not been excited in his sleep; I think his head is cooler."

A little later I received a letter to say that the boy had "ringworm on his scalp again!" that was the last I heard of him.

The connection of cataract and various skin affections has long been noticed and written about by numerous authors, but the doctrine is not accepted by many. On this point I take the liberty of referring to my treatise on Cataract. From it I quote the following, bearing thereon (pp. 47-8.)

SCABIES—CATARACT—FURUNCLES.

Young man, æt. 20, had had the itch one year and a half ago, of which he got rid by internal and external use of medicines. Later, he had an attack of intermittent fever, which he cured with pepper and whisky. A short time since he discovered that he could not see with his left eye. The eye had a dead look; pupil was enlarged and immovable; in the middle of the lens there was an opacity, as if it had been punctured by a needle; the lids and conjuctiva were somewhat reddened. On holding the hand quite near to the eye, he could dimly discern the fingers. August 2, *Sulphur* 6; August 9, SEVERAL PIMPLES ON THE FACE AND ARMS. Sight better. *Sulph.* 6, which was repeated on the 19*th*, 26*th*, and 29*th* of August, and on the 3*rd* and 23*rd* of September. THERE

APPEARED A NUMBER OF FURUNCLES ON THE ARMS; the eye looks natural again, and he sees as well as ever before.—(Fr. Emmerich, "Arch.," XIV., iii., p. 105. In Raue.)

And then (pp. 7-78)—

Dr. Bernard gives an epitome of fifteen cases from Rückert's *Klinische Erfahrungen.*

I will only give the fifteenth as bearing on this point.

CRUSTA LACTEA.

The fifteenth is this: ***Crusta lactea*** disappears and cataract supervenes, which latter is cured with ***Spirit Sulph.*** *(Autore,* Schœnfeld.)

Dr. Bernard also notes that in several of the cases, habitual perspirations re-appear, or a cutaneous eruption either appears or re-appears.

Need we any further proof that cataract is a *cutaneous* affection? *i.e.*, a metadermatosis.

Tetters.

Dr. Becker treated a carpenter who had been affected for some time with tetters about the face, which disappeared after a while without his taking any medicine, but his sight became impaired, everything appeared in a place different from its real position, so that he was unable to use his tools properly.

The pupils presented a misty, smoky appearance, as in the forming stage of cataract. He received *Sp. Sulph.*, ten drops three times a day; *the old eruption re-appeared*, and he now saw everything in the right position, but otherwise his sight was not improved.

Then on March 22*nd*, *Aq. Silic.* was administered in doses of seven drops daily, and this was followed by a great improvement in his sight. He perspired easily, and had much perspiration about the feet. Deposit in urine like lime.

July. A rheumatic inflammation of the foot set in.

Suppressed Perspiration of Feet.

The same gentleman treated a lady whose feet generally perspired freely, and then became very dry, and thereafter she noticed that her

sight became affected in such a manner that everything she looked at appeared to be enveloped in a cloud; she could only read large print.

Aq. Silic. was administered in doses of ten drops twice a day. *The accustomed perspiration of the feet returned again* in about a month. Her eye-sight became much better. Two months later, at the time of menstruation, her eyes became worse again, and she then took twenty drops *Ac. Silic.* three times a day, after which she improved very much, could read better, and continued taking the same remedy.

Scabies—Ague.

(pp. 98-99-100)—

M., aged 20, tinsmith by trade, was affected a year and a half ago with the worst kind of itch, and subsequently with fever and ague. Sometimes he had tearing pains in the left eye, and some itching of the skin, to which he paid very little attention; suddenly he noticed, however, that he had become completely blind in the left eye.

Symptoms.—A staring look of the left eye; pupil dilated and immovable; in the centre of the lens there was a slight opacity; his sight was almost extinguished.

Treatment.—August 2, *Sulph.* 6; from August 9*th* to September 23*rd*, six doses of the same.

Six days after the first dose, *many pustules appeared on the face and arms;* in the meanwhile his eyesight improved so much, that he was enabled to distinguish large letters. From September 13*th* to September 23*rd*, *furuncles on the arm made their appearance;* after that, the skin became clear again, and the affected eye was as useful as it had ever been before.—"Arch.," 14, 5, 105. Emmerich.)

Of the connection of the skin and the lens embryologically and pathologically I treated pretty fully in "Curability of Cataract" but I will now go further and see if I am borne out by other observers.

Let us go to "Essai sur l'étude pathogénique des Cataractes Spontanées" by L. J. Robert, (Paris, 1881, *i.e.* one year after my own views were published.) Robert takes at the suggestion of Professor Boucheron precisely the same

standpoint as I took just a year previously; and first let me quote from myself:—

Embryology of the Lens and its Capsule.

The development of the crystalline and its coat must, of course, be considered in connection with that of the eye as a whole. Now the eyes begin to be developed at a very early period, in the form of two hollow processes projecting one from each side of the first primary cerebral vesicle. Each process becomes converted into a flask-shaped vesicle, called the *primary optic vesicle*, which communicates by a hollow pedicle with the base of the posterior division of the first primary cerebral vesicle. According to the observations of Remak on the chick, the pedicles, originally separate, come together, and their cavities temporarily communicate,

—a condition which may explain the formation of the optic commissure. *The primary optic vesicle comes into contact at its extremity with the* CUTICLE, which somewhat later becomes *invaginated at this point*, and *forms a small pouch pressing inwards on the optic vesicle;* the aperture of this *pouch becomes constricted* and *closed*, and the *pouch is soon converted* into a *shut sac*, *within which the contents*, *subsequently becoming solid*, *form the lens and its capsule.* After the *lens* has been thus *separated from the* CUTICLE the deeper tissue contributes to the formation of the secondary optic vesicle This is as much of the embryonic development of the eye as we need for the present purpose; from it we see that the lens and its capsule are *differentiated skin.* This should be well remembered.

The investigations of Babuchin and of Sernoff lead them to differ but slightly from this in their conclusions. They

say that, as regards the origin of the lens, and the mode of development of its fibres, it is obvious from the *direct transition* of the anterior *epithelial* layer of the lens into the posterior fibrous layer, *that each fibre of the lens is simply a colossal and greatly elongated epithelial cell*, and the history of development shows further that the persistent portions of the body of the lens arise from the EPIDERMOID external layer of the embryo.

The question of the development of the capsule is still open, according to Sernoff, who has long been occupied with its investigation; in the meantime he would appear to deny both its epidermoid origin, and also that it is the product of the excretion of the epithelial cells and of the fibres of the lens. Babuchin inclines to classify it with the metamorphosed *connective tissue* formation.

But some light may be thrown on the question of the origin of the capsule of the lens—a very important question, by the way, for gaining a little firm ground for our therapeutic endeavors—by comparing it with the membrane of Descemet.

The capsule of the lens and the membrane of Descemet have many properties in common; thus portions of either, when treated with re-agents (as for instance, permanganate of potash, or a ten per cent. solution of common salt) will roll inwards like paper that has been long rolled up, and they are both glass-like or hyaline. Hence the opinion of Babuchin, that the capsule of the lens is transparent connective tissue, would seem very probable. According to Rollett, the histogenesis of the cornea requires to be again worked over, especially with the aid of the silver and gold methods of preparation.

But, leaving for the present the origin of the capsule undecided, we are in no doubt of the EPIDERMOID nature of the lens, and also in no doubt of the endothelial nature of the intercapsular cells.

From which we may deduce the general statement that the drugs that affect the epidermis and epithelial structures specifically will also be our remedies in some of the abnormalities of nutrition of the lens, and therefore in some forms of cataract.

From the *albuminous nature* of the lens we may deduce *the general statement that substances which in the living body enter into combination with the albumen to form albuminates, will likewise be remedies in certain forms of cataract.*

THE AQUEOUS HUMOR.

The chambers of the eye are bounded posteriorly by the anterior capsule of the lens, and anteriorly by the

posterior membrane of the cornea, the so-called membrane of Descemet. The iris dips like a circular curtain into the space so designated. They are occupied by the aqueous humor, which differs but little from water in its physical characters, but it contains a small quantity of some solid matter, chiefly chloride of sodium, dissolved in it.—(*Quain.*)

It is very probable that the aqueous humor plays a very important part in the nutrition of the lens.

Etiology and Pathology of Cataract.

For this part of our subject a very important work is *Des Causes Anatomiques de la Cataracte Spontanée*, par Henri Chiray, Paris, 1875.

In general thesis it is maintained that cataract is due to a thickening of

the blood from the abstraction of a portion of its water.

The principal experiments on this point are those of Kunde and of Kühnhern made on frogs, cats, and dogs, with common salt, the nitrate of soda, and concentrated solutions of sugar, introduced into the digestive tube and under the skin. Under this influence the animals rapidly lose a great quantity of water, they attain to an extreme degree of desiccation, and in a period of time, varying from a few hours to as many days, an opacity of both lenses is seen to develop. Some authors will not recognize these as true cataracts, because they disappear as soon as the abstracted fluid is restored to the economy. But, as Chiray observes, this objection will not hold; for what constitutes, clinically, a cataract, is an opacity of the crystalline, and the just-mentioned substances do produce opacities of the crystalline.

So we must say they are analogous, though not identical. But then the same holds good of *all* cases of disease, and therefore of cataract.

Chiray also comes to the conclusion that we must consider it as a fact that *loss of fluid is a cause of cataract.* As examples of this, he reckons the cataracts of the diabetic, and those common to certain trades. Thus glass-blowers, for instance, who work a good part of the day before very hot fires; the *vignerons*, who work very hard in the full blaze of the sun on their shelterless hills; also a certain number of senile cataracts are to be attributed to this same cause; for we know the vascular changes at this age must necessarily impede the interchange of the fluids between the tissues and the blood-vessels; this is particularly the case with the aged, and those who are withered and emaciated by misery and privation.

And reverting now to Robert (Thèse) he sides with Huschke to the effect that the capsule of the lens is a product of the invagination of the common integument, that is to say, a differentiated portion of the ectoderm.

Further, Robert calls attention to the peculiar analogies of the crystalline lens, embryologically with the other *phanères.**

Space will not permit me to go fully into these analogies as elaborated by Robert, but I quote him as occupying in pathology a position almost identical with my own, and I shall refer to him fully presently.

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* [Referring to Kölliker] he says: "Nous nous appuyons dès lors de cette autorité pour considérer le cystallin comme une production ectodermique, malpigho-épidermique (Boucheron) analogue aux autres organes désignés sous le nom de *produits* par de Blainville, et comprenant les poils, les cheveux, les ongles, les dents, &c., organes auxquels on a encore donné, depuis, le nom de *phanères*." (p. 14).

To sum up: What I want to say in a few words is this—an organismic disease of the skin, if driven in, may affect the lens and cause it to become cataractous; and conversely the re-appearance on the skin of said disease may lead to a clearing up of the lenticular opacity: one could imagine the lens and the skin as the poles, the organism as the axis; and to this end alone I have here gone over several questions twice over.

Zonular Cataract, as bearing out the Phaneres idea.

If it be a fact that the lens has a common origin with other products of the body as we affirm, we ought to find analogies in their diseases, and in this regard I would refer to Davidsen's Thesis * on Zonular Cataract. Arlt

* Zur Lehre von Schichtstaar von Sophus Davidsen, Zürich, 1865 [Dedicated to Professor Horner].

connected Zonular Cataract (Schichtstaar) with convulsions and pertussis, and he also called attention to the frequent coincidence of zonular cataract with hydrocephalic cranial forms, whence he concludes that zonular cataract is not congenital, but is developed during the early years of extra-uterine life.

Professor Horner had also long noticed the coincidence of unshapely heads and zonular cataract, notably asymmetry of the roof of the skull. Moreover, it is often noticed that there are peculiar malformations of the teeth in the same subjects, particularly the incisors and the eye-teeth. These teeth have been called rhachitic teeth; but I will not dwell further on the subject here than to say that our author Davidsen shews, with the help of Dr. H. J. Billater, Privatdocent in Zürich, that the abnormality of the teeth so affected is also *zonular*. He winds up

thus, p. 25:—"Nicht weniger wichtig erscheint uns die Thatsache, dass wir in der Linse eine rückweise Erkrankung bald in einer, bald in mehreren Zonen sich kund giebt, ein anderes epitheliales Gebilde, der Schmelz der Zähne ebenfalls eine zonuläre Abnormität zeigt." This refers to the permanent teeth.

Further Remarks on the Aetiology of Cataract.

What I have tried to say in the preceding pages, and what I have now further to say, is meant merely to lead up to my main object in writing this treatise, viz.: How to cure cataract with remedies.

I will not here reproduce the evidence brought forward in my "Curability of Cataract with Medicines," as to the amenability of lenticular opacities to pharmaceutical remedies but refer those interested in the question to it.

Let us look at one or two older authors. We read in *De Cataracta*, autor J.M. Frey, Berolini, MDCCCXXX. p. 22. of the following remedies; Hydrargyrum, Hyoscyamus albus, Aconitum, Millepedes, Mezereum, Conium maculatum, Chelidonium, Pulsatilla. . These were used as internal remedies; the topic applications I leave out of account as I consider them of the same nature as and inferior to operative interference.

Of electricity and galvanism I may say the same, of all of which I have no personal experience, my own experience is with internally administered remedies only.

I have wondered at finding so little hydropathic evidence in favour of my thesis: only one dissertation hereon is known to me, viz. "Uber die Erfolge der neueren Wasserkuren bei Augenkrankheiten," by A. H. Kreuser, Tübingen, 1840. It is here stated

(p. 18) that incipient cataract had been ameliorated by hydropathy both at Elgersburg and at Kennenburg, but the testimony is weak.

I have ransacked the modern literature of Europe for monographic treatises on the medicinal treatment of cataract, and have found four such, but unfortunately all four by quacks or secret-mongers, and this fact militates much against any progress being made. I will not mention even their names; the name of the secret-monger deserves to rot, and these four wretches I leave in their merited oblivion.

To understand what line to proceed on, we must keep well before our minds that the lens (the seat of cataract) is in a unique anatomical and physiological position.

Histogenetically it is *differentiated* ectoderm, or skin; it was in its embronic stage invaginated and cut off,

and became a transparent optic medium. As such it has no blood-vessels and its life is peculiarly unique; to fulfil its purpose it must remain clear and transparent, and has nevertheless to live; it is nourished by imbibition from the *humor aqueus*, and also excretes into it: its physiological life is purely osmotic.

The aqueous humor is derived from the blood, and its specific gravity rises and falls with that of the blood: this I have already amply demonstrated from reliable experiments. This much is science. We *know* it.

We will not tarry here to study the particular blood-vessels that bring the blood from which the aqueous humor is derived and kept up, it would lead too far, and is not needful for my purpose, though I will refer to this again.

No one will deny this, or that the aqueous humor *is* derived from the

blood, or that the lens lives in this humor by endosmosis and exosmosis.

The lens being thus, as it were, cut off from the organism, lies beyond the *direct* reach of remedies, much more than the ordinary organs of the body.

I do not in the least question that there are remedies that specifically affect the lens, but I am not acquainted with a single one myself; I know specific remedies for almost every organ and part of the body, of some a great number, but not one single lens-medicine have I been able to find.

If we had only half-a-dozen remedies that had a powerful well-pronounced affinity for the lens—good reliable lens-medicines—curing cataract with medicines would not be so difficult as it is.

Perhaps the *nearest* approach to a lens-medicine is the chloride of sodium, and I have sometimes thought the title

of lens-medicine might be vindicated for it, but I am not sure. I have in vain sought a lens-medicine in the literature of the organopaths (Rademacherians) but have not found even one.

Geranium Robertianum may be possibly, a *phacicum remedium.*

Nature herself cannot cure cataract, or at least does not do so, as everyone knows, for when a cataract gets over-ripe and fluidifies, the fluid is even more densely opaque than a common ripe cataract. Still it is possible, as we see from the following :—

Spontaneous Transparent Fluidification of Cataract.

I mention this here in connection with treatment to shew that it is *possible* for nature to fluidify a cataract with a *clear* fluid, which *is* shewn by

Nordman's case, and this I will here note, and were it only as a curiosity in ophthalmic experience. The case was brought before and demonstrated to the Congress of Finlandish Physicians, 14 September, 1883, and was published in the Archiv für Augenheilkunde XIV. *

The subject was a stalwart peasant of 55, who went blind with double cataract. But he partly recovered his vision and *then* came to the Helsingfors eye clinic, when Dr. Nordman operated successfully on the left eye for common senile cataract, but the right sided cataract had become fluidified and *clear*. Professor Becker also observed the case and agreed with the diagnosis.

Nordman says that this case shows that in Cataracta Morgagni the cortical

* Fall von Cataracta Morgagni (hypermatura fluida) mit wasserklarer Corticalflüssigkeit von S. A. Nordman.

fluid is not necessarily opaque, and as vision had been spontaneously restored he regards it as a successful attempt of unaided nature to cure cataract; still the case is more a curiosity than of practical value.

I have myself observed the complete spontaneous cure of cataract of the right eye in a lady of 70 years of age. I had often seen the lady in society and had noticed a very prominent cataract of the right eye for a number of years; nothing was done for it, when one morning it was gone. I looked at it and examined it with some care, and came to the conclusion that the cataract had been a soft one, and had become distended and finally burst, for a certain portion of the fluid could be still seen quivering whenever the globe was moved; the eye has good vision for large objects, without spectacles, and this notwithstanding the aphakia.

Inflammatory Cataract.

Walther was of opinion that cataract was of inflammatory origin and he therefore believed in its curability by remedies.

Then he was quite ridiculed out of his position because it was demonstrated that the lens and its capsule have no blood-vessels.

Modern exact experiment has, however, re-instated the possibility of inflammatory cataract, and hence we may again speak of phakitis and phakohymenitis.*

Walther cured or ameliorated cataract with antiphlogistics; and cases of cataract cured by *Aconitum* are on record already in Hufeland's Journal, and then since Dr. Julie Sinclair (a Russian lady) has *produced* cortical phakitis experimentally.

* The words lentitis and capsulitis are *too* horrible!

That there are cases of cataract concomitant with iritis and choroiditis is well known, and in these *Aconitum* will be indicated, and also and more particularly *Sulphur* and *Calcarea Carbonica.*

The gouty cataract lies close here, and in another place I will place on record a case of cataract of this kind which has never been published, and which was sent me from Germany. I refer to Von Grauvogl's case.

Walther was very strong upon an inflammatory state of the lens and of its capsule as the great cause of cataract, and modern research proves its possibility. Dr. Julie Sinclair, "Experimentelle Untersuchungen zur Genese der erworbenen Kapsel-katarakt, Zürich, 1876," made a series of exact experiments on this part of our subject, and concludes as follows:

"The acquired capsular cataract is brought about when, as a consequence of chemical or inflammatory alteration of the circum ambient fluid media, the nutrition of the lens is disturbed. The disturbance in the nutrition is at first expressed in the lens-substance, and that in the superficial layers of the polar region, either because the lens-substance is at this part immediately exposed to the disturbance or because the ends of the tender lens fibres that converge at the poles are least capable of resistance.

"Then the capsular cells at the anterior pole are attacked by the nutritional disturbance."

Lens-substance and capsule-cells first opacify and swell, and then break up into an amorphous gelatinous substance, that thereafter becomes granular and friable, which substance is thickest at the pole, thinning off to nothing towards the

equator, and adheres closely to the internal surface of the capsule. This substance constitutes the essential permanent basis of the opaque capsular mass: this constitutes the first stage of the formation of capsular cataract; the *stage of degeneration* (Destructive). Then follows the *Stage of Regeneration.*

The development of acquired capsular cataract is an inflammatory process for destruction and regeneration, are the essential factors of inflammation in non-vascular tissue.

The capsule of the lens takes no active part in the process of the formation of capsular cataract; its bulging and puckering are non-essential secondary conditions.

Direct Bearings of Aetiology on the Treatment of Cataract.

Although I again go over some of the ground already traversed in these pages, and although what I am about to condense from Robert has really been matter given already, still I think the repetition will do no harm, being differently phrased, and may fitly lead up to what I have to say more specifically on the treatment of cataract by remedies.

The most philosophic view of cataract is taken by Robert (thèse), and I must now proceed to quote from him, as his position is identical with my own, and worked out much better than I was able to do it in my "Curability of Cataract."

According to Robert, then, the crystalline lens is a colony of Malpighoepidermic elements, isolated by an

adventitious structureless membrane, the capsule, the whole plunged and suspended in the middle of the humors of the eye. For as the nutrition of these elements, notwithstanding their differentiation and isolation, takes place in the same manner as that of the simple Malpigho-epidermic elements, and of the differentiated ones of the skin, and of certain glands and phanères.

It is by studying the nutrition of these different groups of etodermic elements that we can best understand the nutrition of the crystalline.

According to those authors who have expressed an opinion on the subject, the presence of an epithelial layer in the anterior surface of the substance of the crystalline very manifestly shews that nutrition is carried on at this point with greater activity than in the rest of this organ; and as

this latter is entirely without blood-vessels, the materials for its reparation must necessarily reach it through the capsule (De Wecker, traité des maladies des yeux).

The nutrition of the crystalline, says again M. Galezowski, (in the "Recueil d'ophthalmolgie, 1880,") is carried on by endosmosis and exosmosis and it is through the intermediary of the anterior crystalloid (capsule) that the aqueous humour enters the cavity of the capsule to carry thither the materials of nutrition which it holds.

We see again indicated in the *Traité des Maladies des Yeux* of M. Abadie (vol. I, 1876) the rôle of the epithelial cells of the anterior crystalloid.

The researches of Leber, says M. Abadie, have brought to light the importance of the physiological rôle of these cellules. In like manner as the

epithelial layer that lines the membrane of Descemet opposes by itself alone the imbibition of the cornea by the aqueous humor, so that which lines the crystalloid * prevents the aqueous humor from penetrating in its entirety into the lenticular tissue; it is this layer of epithelial cellules that regulates the endosmotic and exosmotic phenomena between this tissue and this fluid, the nutrition and the maintenance of the transparency of the lens consequently depend upon the integrity of this epithelium.

The opinion of these various authors which we have just cited pretty well epitomizes the actual state of science on the subject which occupies us. The question is only just touched upon, and we may push our enquiry a little further by following the analogy that exists between the crystalline and

* I leave the French term *crystalloïde*, as shorter than "capsule of the lens."—J.C.B.

the other phaneres, both from the standpoint of nutrition as also from that of the origin and of the anatomic constitution of these various ectodermic products.

In the skin (I am still quoting from Robert's Thesis) the Malpighian cellules and their dependencies are not at all in direct contact with the blood-vessels; they are separated therefrom by superficial layers of the derma, and only these possess blood-vessels. The nutritive elements emanating from the blood-vessels penetrate by imbibition and endosmosis into the Malpighian cellules, and afford them what is necessary for their nutrition; their effete products re-enter the general circulation through the lymphatic and sanguineous vessels of the derma.

In the Malpigho-epidermic groups, differentiated as isolated glands, by a structureless adventitious membrane

(membrana propria), the nutritive fluids coming from the blood-vessels penetrate by endosmosis through the structureless membrane into the glandular cellules, and supply the materials for their nutrition and their special secretions, as is the case with the phanerous nails and hair.

In the case of the crystalline, the malpigho-epidermic elements of which it is comprised, receive their nutritive fluids through the structureless crystalloid membrane; only the blood-vessels that supply them, instead of being immediately adjacent are separated from them by a collection of fluid, serving further to form the transparent media of the eye. Above all there are the ciliary processes, and accessorily the choroid and the iris, which are charged with furnishing the nutritive fluids, mixed with the watery fluids of the humors of the eye.

The dermic papillae supply the malpighian elements of the epidermis and the glands with their nutritive fluids while in the eye, the analogous elements of the crystalline are separated from the supply blood-vessels by a kind of lake, into which on the one hand the blood-vessels pour their nutritive materials, and whence, on the other hand, the crystalline absorbs by endosmosis what it needs for its nutrition. It then expels into this same lake by exosmosis the retrogressive products of its nutrition.

The liquid medium which washes the cutaneous glands and the malpighian strata forms a liquid mass of no great quantity, while the crystalline, with its capsule, is steeped in a comparatively large quantity of fluid, wherein the nutritive elements which it absorbs are held in solution.

Robert goes on to speak of the rôle of trophic nuclei *(noyaux trophiques—*

Boucheron), saying that the nutrition of the malpigho-epidermic layers is such that the horny parts of the epidermis, for instance, are incapable of living even when they are in contact with the nutritive fluids. Those horny cellules that have lost their nuclei, in varying degrees, can no longer elaborate or assimilate the nutritive fluids when the malpighian cellules with large nuclei have ceased to function. Hence every destructive alteration of the nucleus and of the malpighian cellules produces alteration and death of the horny layers of the epidermis. The vascular changes of the Malpighian cellules (Leloir, Renaut, Cornil, &c.) lead to premature desquamation of the horny strata or to other lesions studied in dermatology, vesicles, pustules, &c., whose end is always necrosis of the epidermis *

* Consult on this point *Annales de dermatologie et de syphiligraphie*, 1877 to 1881.—Histologie normale de la peau par Renaut.

Hence the integrity of the nucleated cellules, which by reason of their function are called trophic by Boucheron, is necessary to the life of the simple horny strata of the epidermis, or of the horny strata differentiated into hair and nails. So we see it is in the changes of the Malpighian cellules that we must look for the changes of the horny parts of the epidermis.

In the crystalline, an ectodermic production, (the malpigho-epidermic of Boucheron) the formation and the growth of this organ depend upon the cellules of malpigho-epidermic origin properly so called, but slightly differentiated. Hence it is also in the changes of these malpighian cellules, located at the periphery in the region called *zone of the nuclei*, that we must seek the pathogenetic origins of the changes in the crystalline substance, which is the analogue of the horny strata of the epidermis and of the *phanères*.

Robert then compares senile cataract to the loss of hair and teeth in the aged, which I (Burnett) do not think necessarily follows, as the aged do not lose their nails, and yet the nails are as much *phanères* as hair and teeth.*

Robert points out further that from the pathologic standpoint the general diseases, be they constitutional, diathetic or accidental, which are followed by changes in the malpighian cellules of the skin and of the phanères lead to the decay and falling off of the epidermis, of the hair, nails, &c.; and equally they may, under certain circumstances and by analogous processes cause changes in the malpighian cellules of the crystalline, and produce fatty degeneration of its fibres or cataract, and that under conditions and at abnormal ages at

* I have twice observed finger and toe nail disease coincident with very pronounced premature *arcus senilis*.

which senile cataract does not develope. Such are he says, the cataracts sometimes observed after grave diseases, typhoid fever, variola, measles (and I would add varicella), as also after those affections that lead to organic decay more or less considerable, such as diabetes mellitus, phosphaturia.

I quote thus largely from Robert because he not only gives the latest views of the most advanced men of the French school, but because he so completely demonstrates the soundness of my own views in regard to cataract.

All this leads me to continue to seek for my remedies for cataract amongst those that influence the skin; Robert's generalisation leads him to the—knife!

Not only is the bearing a therapeutic one, but also aetiologic, which reflects back again to the same therapeutics.

Diabetic Cataract.

It has been seriously questioned whether this morbid individuality is due to the presence of sugar in the aqueous or to general conditions such as may be engendered by any devitalizing disease. Both sides shoot well.

Robert argues for its general nature. But are not both possible? May we not have a genuine sugar disease resulting in cataract, and a cataract from marasm in the diabetic?

The fact cited by Robert that the eye-surgeon is often applied to for help on account of failing sight, no other ill being present, tells rather against Robert's proposition. The oculist finds sugar in the urine of such a patient and the patient is only conscious of his ocular symptoms, and of nothing else. How then can it be due to the *appauvrissement qui est la conséquence fatale de la déchéance vitale qu' amène dans l'organ-*

isme toute maladie grave? There is no *déchéance vitale* present if the patient does not know he is ill, though he feels his sight failing. Still I could well believe that there may be cases of cataract in advanced stages of diabetes due not only, or not merely, to the sugar, but to a *déchéance vitale* not differing from the *déchéance* from albuminuria.

The treatment of diabetic cataract should, if possible, be directed to the mother cause of the diabetes; if this cannot be found, or, if found, affords no therapeutic clue, we must fall back upon the medicines which have been found efficacious in diabetes itself. At least the cataract could be operated upon when the diabetes was cured or much ameliorated, and the successes of medicines in the treatment of diabetes are very notable. Myself—I usually go back to the general teachings of Hahnemann, and, when these fail, to

empiricism, or home-spun hypotheses which I will not inflict upon my readers at this place. Antisycotics, antipsorics and hepatics are my mainstay, and *Thuja*, *Sabina*, and *Cupressus* I would specially commend.

The *most commonly* indicated remedies are, *Sul.*, *Psor.*, *Calc. c.*, *Silicea*, *Phos.*, *Puls.*, *Chelid.*

Professor Seegen gives two cases of diabetic cataract ameliorated by the use of Carlsbad water, the elimination of sugar being diminished—so its action was *general.*

Cataract following in the wake of Grave Maladies.

Robert's chapter on this subject is instructive and suggestive. He enumerates typhoid, measles and variola—*lesquelles amènent comme le diabète une déchéance vitale.*

He calls attention to the fact that these cataracts are not recognized until *a good while after* said diseases have run their course. The frequent occurrence of "typhoid" in my own anamnetic notes of cataract cases has often struck me. I have known cataract follow varicella.

Trélat, it appears (Gazette des Hôpitaux. 1879, No. 53) was the first to notice Cataract as an apparent sequel of typhoid.

M. Teissier, fils, of Lyons, credits an excessive elimination of phosphates with being able to cause cataract. Phosphorus we know has often rendered real service in the cure of cataract.

M. Romiée, of Liège, has made many important observations on the ætiology of cataract: he cites 25 cases of double cataract arising from a

general cause by which name he understands "l'ensemble des conditions qui rendent l'état général tel quelles lui font mériter la dénomination de mauvais, débile, comme par example, cela a lieu à la suite d'une fièvre on d'une maladie grave, après des pertes menstruelles trop abondantes, &c."

Excessive menstruation I have also frequently noted as a precursor of cataract.

Romiée observed 17 cases of cataract after typhoid; 7 after variola; 3 after scarlatina; 7 after chlorosis (hæmorrhage, excessive discharges); and 10 from different maladies, such as prolonged suppurations, rachitism.

The supposedly causal complaint precedes in some of M. Romiée's observations as many as 6 to 10 years, which is a little too far off for M.

Robert. One wonders if M. Romiée has ever read Hahnemann!

"Essai sur quelques affections générales on locales susceptibles de compliquer la cataracte. Par A. Pintaud-Desallées. Thèse, Paris, 1872." Here the subject is approached from a totally different point of view, as the title indicates. We note diabetes, albuminuria, chronic alcoholism as possible contra-indications for operative interference, and of course these same maladies may have a causal nexus. This thesis contains some interesting cases, but the author's aim is to operate—*quand même!*

A very important work on my subject is "Contribution à l'étude sur l'étiologie de la cataracte. Par Gyula-Jules Ullmann. Thèse, Paris, 1881." But I must break off, lest I hide the view of the forest with trees.

The Treatment of Cataract by Medicines.

I have already and often related how I was converted to believe it possible to cure cataract with medicines, and many other of my practical cases have now proved that cataract is *not* immedicable, is not in fact Τὸ Πάθος οὐκ ἰάσιμον as it is currently thought to be; elephantiasis græcorum may be, but cataract is not.

Of course if no one sets about healing cataract with medicine it must be, and must ever remain, immedicable.

The case that converted me has stood on record, and having been published before it is not used here, but merely mentioned as the point where I came to believe it possible to cure cataract with medicines, and thus fitly to introduce the therapeutic part of my subject.

I have at present very considerable experience of cataract and of its treatment by medicines, and I clearly see that my first case of cataract was (as I originally stated) inflammatory in its origin and development, and not senile. That however does not militate against my thesis, for very competent oculists diagnosed the cataract, declared it to be incurable by medicines, foretold the necessity for an operation, and vaguely defined the time when it would be ripe.

The subject of the practical medicinal cure of cataract being now before my readers at that stage where this first unexpected success drove me on to this new island of the homœopathic world of therapeutics, I will proceed to give the practical outcome of my subsequent twelve years' experience.

But before doing so, I will just bring a very interesting

Case of Cataract Cured by the late Staff-Surgeon Dr. Von Grauvogl.*

It has never been published, and I am happy to be instrumental in placing it on record. I will leave it just as I received it, errors and all :—

[Translated extract from the letter which Mrs. Leisler brought me this afternoon.]

"My father when he was 69 years old was almost quite blind on both eyes from gray staar (I don't know if that is spelt rightly, but you know.) Dr. Coccius in Leipzig was to operate upon them in about six months, when my father made up his mind to try homœopathy, and with such success that in about four months he could see again, and in half-a-year could read without difficulty ; which he continued to do quite up to his death when 78 years old. Since then the doctor who treated him has died—it was the celebrated Oberstabsarzt (staff-surgeon) Dr. Von Grauvogl. Luckily, however, no secret is made of the means by which the homœopathists cure this disease, and so I know that it was Sulphur

* One of the greatest thinkers of modern medicine.

and Chalk—naturally greatly diluted. I will enclose a recipe, which if sent to an homœopathic apothecary will procure the right weakness. If there be not one in Frankfort, I know that in Nuremberg there is a good one, and send the address, as it can easily be obtained there.

"I must add the doctor said my father's staar was caused by gout, and if the case of the lady mentioned be from the same cause, the use of this means (which can do no harm in any case) ought certainly to be tried.

"Should the staar arise from other causes, perhaps *this* means might *not* help; but homœopathy has a number of others for the staar that a really good doctor can recommend, and from my experience I would strongly recommend such a doctor to be consulted; as this has often been done for this sort of disease with success."

[Then comes the recipe, which I send, and this note to it.]

"Night and morning from one to two drops of this means are to be taken in a tablespoonful of water—one day the one mixture and the next the other; and so on for about twelve days. Then make a pause of 8 to 10 days, after which again take the medicine as above. In 10 or 12

days make another pause, and continue in this manner two months. When objects become clearer to the blind eyes, the pauses are lengthened—less and less and only *once* each day will be taken, until it can be quite left off.

"Vinegar—in fact all kinds of strong acids, coffee, and strong wine are forbidden during the cure. *Good*, clear, pure beer and tea were allowed."

Patient and doctor are dead, but the fact lives, and I take pleasure in publishing it.

I am not able to list the remedies I have found useful in cataract, or to furnish precise indications for them; to medicate for cataract the best plan is to treat the PATIENT and not the cataract.

At first I had intended putting all the drugs together that have ever produced cataract, and out of these constructing a short practical "Materia Medica for Cataract," but this cannot be done with our present paucity of

material, and moreover I have thus far found but very few clinical indications for cataract-causing drugs.

This was at first a source of great and bitter disappointment to me, and I began to overhaul my notions of the law of similars, and to ask myself why it was that ergot—which causes cataract—and sugar, salt, urea, &c., which do the same—why it was that all these seemed to leave me for the most part in the lurch.

After some reflection I came to see that the remedies which we need in the medicinal treatment are such as are homœopathic to the state of the patient with cataract, though not necessarily those that have actually produced a lenticular opacity.

For instance, ergot has been used in cataract with but small benefit, because it has been wrongly used, that is, used in the wrong cases.

Assuming the ergot cataract to be due to necrosis from spasm, it would follow that ergot would be only homœopathic to incipient cataract from a similar state of spasm of, say the nutrient blood-vessels, and to this stage of differential refinement we have not yet got with physical diagnosis.

I would not prejudice the future of the question, but at present I see no sure means of using cataract-producing drugs as cataract-curing remedies, other than purely symptomatically. Moreover, it is very rare that cataract exists by itself, a careful diagnostic survey of the whole physical self of the cataract-having patient readily proves the truth of this. The problem to be solved in other words, is more or less complex, and we can indicate "How it is done" only in a general way, say the first two or three prescriptions, and then the case must be carried on, like a game of chess, by the individual handling the particular case.

I have ameliorated and arrested many cases of cataract, and quite cured a good many, and I will proceed to explain how I set about it and carry it out.

I call attention to the fact that a fully developed cataract is almost the last link in the pathogenetic chain, and that therefore the earlier the cataractescent state is diagnosed, and the sooner medication is begun, the greater are the chances of succeeding in this very difficult but possible task.

To aptly illustrate my meaning I will take a fit case that has recently come under my care. The lady in question has a friend who was cured by me of Cataract, the progress of whose cure she herself witnessed; she came to me for cataract (diagnosed by an eminent specialist) and I set about taking her case, as I imagine

Hahnemann would do were he now alive, enlightened by modern research, and in harness.

Mrs.———, forty-six years of age, the mother of three children, was lately pronounced by Dr.———, an eminent authority in such matters, to be suffering from cataract of both eyes. On using the ophthalmoscope I find both lenses uniformly milky, but the red fundus is well, though indistinctly, seen through the cataractescent lenses.

Her teeth are all gone, and I therefore think of the phanères-idea developed by Robert and in this I am strengthened by noting that her hair is thin and weak.

On examining the heart, I find an endocardial bruit best heard at mid-sternum, her spleen pains her, and it is

notably enlarged. All her pains preponderate in her left side; she has a good deal of pain at the bottom of her back, worse when she is sitting. Her feet are cold.

She has a small exostosis at the distal end of the proximal phalanx of her right index.

Her Father died of rheumatic gout; I therefore bear this in mind.

She is very fond of eggs, being in the habit of eating one or two every day for very many years.

As I have reason to believe that too much albumen in the blood conduces to cataractescence (I trust I may be forgiven for coining the convenient words cataractescent and cataract-

escence) I recommend her to eat eggs very sparingly and to supply their place with food in a less concentrated form.

She has been three times successfully vaccinated; she formerly had leucorrhœa very badly, which was cured (!) by long continued injections; she has had much sorrow the past year or so; her nipples cracked at the early part of her second and third lactations; she has had bad indigestion all her life; of the principal complaints from which she has suffered I thus elicit—

1.—Leucorrhœa.

2.—Sciatica (left), and exostosis, endocarditis.

3.—Enlarged womb for which she wore a pessary for years.

4.—Pains down left arm.

5.—Pertussis.

6.—Morbilli.

7.—Varicella.

8.—Neuralgia of nose, forehead and jaw.

9.—Boil in chest.

10.—Dyspepsia.

11.—She did not suckle her children, and finally she has ceased menstruating.

Now if this case is to be either bettered or cured, it is manifest, I think, that it must be approached on very broad lines first, yet analytically withal. To merely seek a cataract-producing drug is not enough; the *patient* must be treated—

1.—As to her *leucorrhœa*, I am of opinion that it was never cured, but suppressed.

2. The *sciatica*, the *exostosis* and the *endocardial bruit*, tell me she is arthritic.

3. The *womb* being still large, I bear its involution in mind and remember the effects of this state upon the digestion, and the sympathy between the womb and the eyes.

4. The *pains down the left arm* I connect with the endocardial bruit, and note here anent that she gets easily out of breath.

5. As to the *Pertussis* I call to mind that bad coughs are said to weaken the lens.

6. Of the effect of *measles* on the lens I know nothing, but measles has been accused of having cataract as a far-off sequel.

7. *Varicella* I have known to be followed by cataract.

8. The neuralgia I take to be arthritic (sycotic).

9. The *boil* on the chest may indicate a psoric taint.

10. The *dyspepsia* and the cataract may have a distinct connection since a dyspeptic person can hardly prepare good healthy blood, and the close connection of weak digestion and eye diseases is admitted.

11. She did not suckle her children and her blood-life would, of necessity, have suffered in consequence.

12. The enlarged spleen too must be set right, and vaccinosis may be a causal factor to be reckoned with. Indeed I began my treatment with *Thuja* because of the suppressed whites, because of the enlarged spleen, and because of the heart trouble. I call to mind in this connection that suppressed

gonorrhœa is sometimes followed by endocarditis, and this might also, be true of leucorrhœa.

Here is a chapter of ailments; and will any sane physician now tell me that the *proper treatment* for this poor lady is to give her eye drops; to tell her to wait till the cataract is ripe and she herself blind, and that then we will let the light into her eyes again by ridding her of her opaque lenses by operative means?!

And yet that is the very advice she actually got just 3 weeks ago, and that from a most eminent man, a great man some think. Truly it does not take much in these days of medical carpenters and tinkers to be great.

After all I think the old sage of Chelsea was not far out in his celebrated dictum.

After I had noted all my patient's replies to my numerous questions, she turned to me in a decided way and said, "Doctor, I only want you to cure my eyes, I don't mind the other things."!

Were I now asked what the remedies for this case are likely to be I should name the following in the order they may probably be called for—*Sulphur*, *Calcarea carbonica*, *Aurum metallicum*, *Aurum muriaticum natronatum*, *Ceanothus americanus*, *Nux vomica*, *Ignatia*, *Bellis perennis*, *Causticum*, *Silicea*, *Heclæ lava*, *Urea* and *Aconitum*.

Roughly, and failing precise indications for other remedies, these are the remedies she will get from me, provided she have the patience to go on with the treatment, which is perhaps doubtful. But should she prove a dutiful patient, what will be the probable course of the case?

This: she will slowly feel better in herself, her digestion will improve, her spleen will be restored to its normal size, her heart will get stronger by the direct action of the cardiac remedies, and by its being fed with better blood, and the heart will work more easily by the removal of the obstructive spleen engorgement, the sub-involuted uterus will go smaller and she will be very emphatic in stating: "I am so much better and stronger in myself"—

But the cataract? This will slowly improve with the general state, and vision will very greatly improve so that an operation will not be necessary. With my present knowledge and experience I can give this as a positive prognosis.

Should any one ask for my indications I can only refer them to the Materia Medica Pura, and to the *Penetralia homœopathica* as found in the

accumulated experience of the many great and eminent men who have practised homœopathically during the last half a dozen decades and which is deposited in our vast literature.

Let any one who wants to realize all this get and carefully peruse a complete file of the Allgemeine Homœopathische Zeitung, of the British Journal of Homœopathy, of the North American Journal of Homœopathy, and of any other half dozen homœopathic journals that have had a long run. Only in this way can the subject be really and fully understood.

Those to whom such a task is too time-devouring or too expensive may get a fair idea by reading Hughes's "Pharmacodynamics" and "Therapeutics," and a few such other treatises. The subject is too vast to be easily compassed by one writer.

For a record of actual cases of cataract cured by medicines, I would refer the reader to my oft-mentioned "Curability of Cataract with Medicines" and to my "Fifty Reasons for being a Homœopath;" and I hope by and by to place on record the details of a number of cases of cataract ameliorated or cured by medicines and so side by side that they may be of some help to other physicians. I have notes of a good many cases of cure which I had intended adding here, but my book is already far too big.

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